DECEMBER 1952

The Paper Industry

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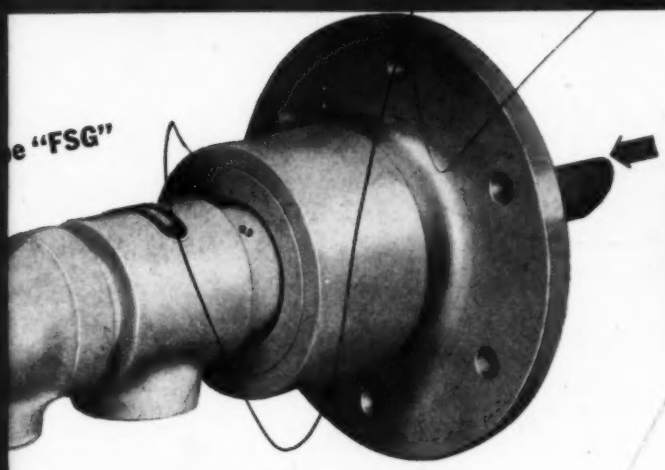

ROTARY UNION
REG. TRADE MARK

The **Most Compact**
Most Economical
Longest Lasting
revolving steam joint you can buy . . .

This is the joint that is integral with the journal, has a minimum of overhang, and requires no lubrication or adjustments.

The Type "FSG" ROTARY UNION* was designed especially for the high speeds, pressures, and temperatures, and the continuous heavy duty service required on paper mill dryers, calenders, and digesters. The unit is flanged directly to the journal and revolves with the drum itself. Its special heavy duty, low friction, metal-backed graphite bearing requires no lubrication and withstands high pressures and temperatures. Two-point support gives better alignment and prevents wearing through and falling off of syphon pipes, eliminating costly down time.

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*There are 40 standard sizes and types of ROTARY UNIONS for every sealing need.

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For Faster Uniform Drying

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Here's a proven pulpwood loader to save YOU money and manpower

"PULPWOOD YARDSTER"

You'll be amazed at the way the new PULPWOOD YARDSTER loads pulpwood from a truck onto railroad cars. This new tool is compact, mobile and surprisingly low in both initial and maintenance costs. It is specifically designed to save the operator manpower, time and money. New descriptive folder tells all about this machine. Write for your copy today.

- **TRUCK** is unloaded by a split load with a capacity of approximately 1½ to 2 units per load. Approximate maximum capacity is 12,000 lbs. Standard pulpwood truck can be unloaded and the wood loaded onto a railroad car in about six minutes.
- **PHOTO** at right shows PULPWOOD YARDSTER approaching railroad car for unloading operation. Can be locked in rigid operating position. Operator has finger-tip control of load at all times.
- **RAILROAD** car can be bumped by using PULPWOOD YARDSTER Bumping Plate, which is standard equipment. Photo below shows machine in bumping position.

Write for the Facts TODAY!

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Please send me complete information about your new PULPWOOD YARDSTER.

NAME_____

ADDRESS_____

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Sound Selling vs. Smart Talk

Today, essentially, all of the chemical companies have established technical service and sales-supporting technical work. One corporation has 25 laboratories devoted to this type of work supported by 29 field laboratories. The total investment by the industry in such facilities, must run well into the tens of millions of dollars, which is one measure of how importantly the industry regards the sales function.

It is now estimated that 70% of the average chemical company's sales staff is technically trained compared with probably less than 25% only 20 years ago and an insignificant percentage 30 years ago. This current mode of selling is epitomized in the slogan of one chemical manufacturer, namely, "Serving Industry through Practical Applied Science."

From an article: "Selling . . . Its Importance in the Chemical Industry," by J. Warren Kinsman, Vice-President, E. I. du Pont de Nemours & Co., Wilmington, Del., in Chemical Engineering Progress.

Nalco appreciates the use of its slogan, "Serving Industry through Practical Applied Science", as an example of the modern approach to chemical sales. 100% of Nalco's field service representatives are technically trained to help industry make full practical use of the chemicals and methods developed by the Nalco Laboratories: Water, Microbiological, Physical Chemistry, Organic Chemistry, Corrosion, Micrography, Metallographic, Experimental Boiler, Combustion, Oil Treatment, Paper, Ion Exchange, Weed Control, Production Control.

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THE *Nalco*® SYSTEM . . . Serving Industry through Practical Applied Science

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 34 • NUMBER 9 • DECEMBER, 1952

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take a CLOSER LOOK at

B&W STAINLESS TUBING DATA

Mr. Tubes—your nearby B&W Tube Representative—will be happy to provide additional information and to discuss any specific tubing problem with you.

Engineering data on stainless steel tubing . . . prepared by engineers for engineers . . . pours out of Babcock & Wilcox headquarters in an endless stream of technical literature and other communications, to keep designers, stainless fabricators and process engineers well-informed about latest stainless tubing developments and applications, and to provide an interchange of field experience among stainless tube users.

Important findings of metallurgists and application engineers, of chemists and other specialists concerned with corrosion resistance, fabrication and special tubing needs are condensed and published in ready-reference form as fast as data can be reviewed and verified.

B&W offers a most comprehensive file of information on stainless tubing, both seamless and welded. The technical help this literature offers is exceeded only by the personal assistance on specific tubing problems you may expect from B&W field representatives.

If you want stainless tubing facts where you can find them—tips to help you speedily solve tubing problems and to suggest ideas for greater stainless tubing service satisfaction—send for B&W bulletins you may select from this partial list of current data.

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- ☐ TB-11 Specifications for Seamless and Welded Tubular Products—Stainless, Alloy and Carbon Steels
- ☐ TB-15 Weight Tables, Round Seamless and Welded Steel Tubing
- ☐ TB-19 B&W Stainless Croloy Tubing Steels—Seamless and Welded, Condensed Technical Data
- ☐ TB-332 B&W Stainless Pipe, Seamless or Welded
- ☐ TB-335 Descriptive Terms, Steel Tubing, B&W Seamless and Welded Tubes
- ☐ TB-344 Applications of B&W Tubular Products—Stainless, Alloy and Carbon Steel, Seamless and Welded
- ☐ TR-506 Properties and Characteristics of 27% Chromium-Iron
- ☐ TR-516 Some Experiences in Service
- ☐ TDC-130 B&W Stainless Pipe and Tubing—Croloy 18-8S (Type 304)
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- ☐ TDC-133 B&W Stainless Pipe and Tubing—Croloy 16-13-3 (Type 316)
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- ☐ TDC-140 B&W Stainless Pipe and Tubing, Croloy 12 Al (Type 405), Croloy 18 (Type 430), Croloy 27 (Type 446)
- ☐ TDC-143 B&W Stainless Tubing, Croloy 12 (Type 410) 12-2 (Type 414)
- ☐ TDC-148 Condensed Data on Working Seamless or Welded Tubing and Pipe—B&W Croloy Stainless Steels
- ☐ TA-1517 B&W Stainless Steel Tubing for the Food Processing Industry
- ☐ TB-328 How to Keep Down Maintenance Costs in Pulp and Paper Mills—B&W Tubing and Pipe Stainless, Alloy and Carbon Steel

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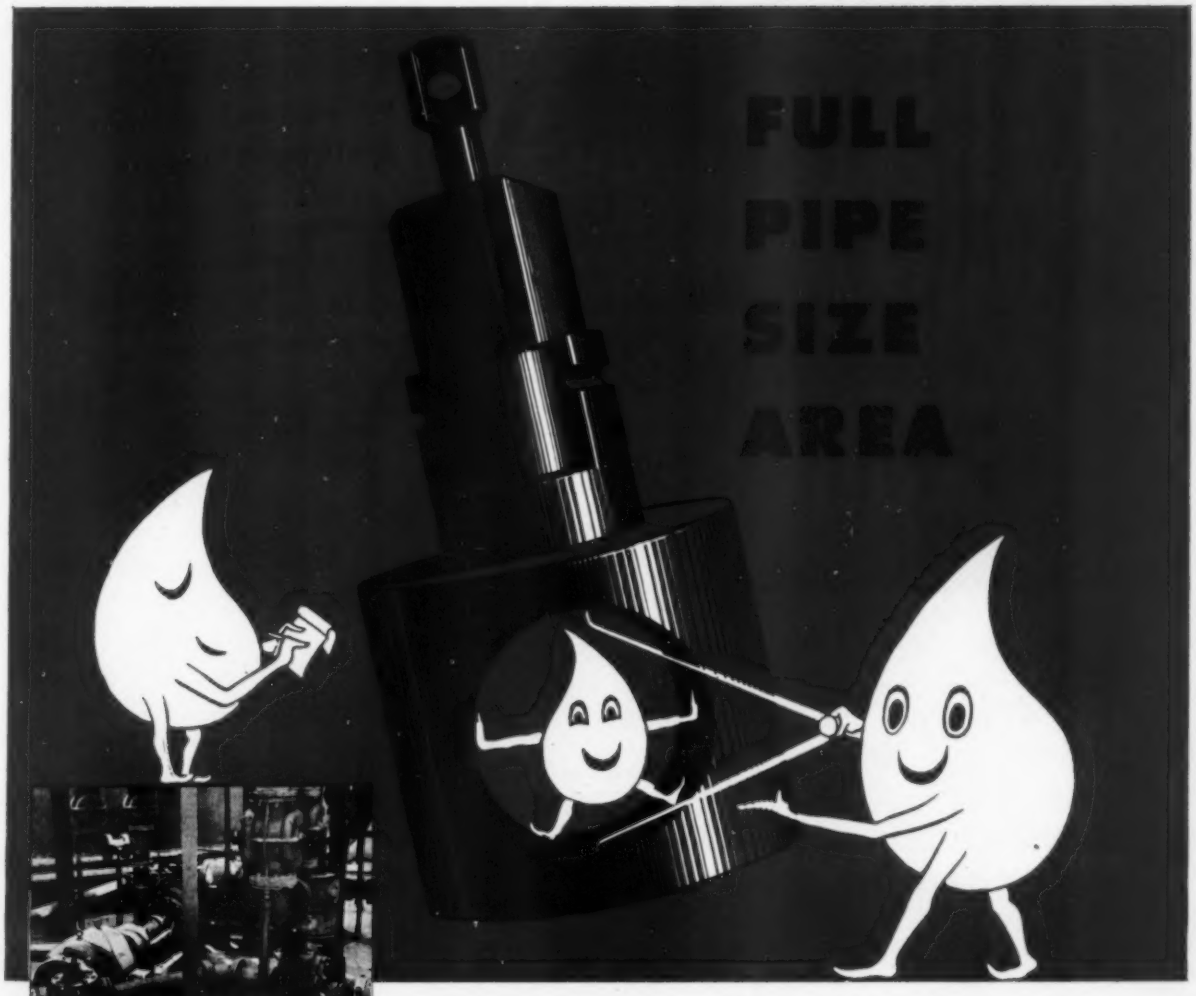

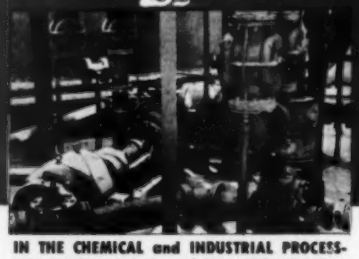

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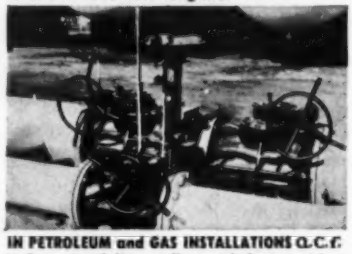
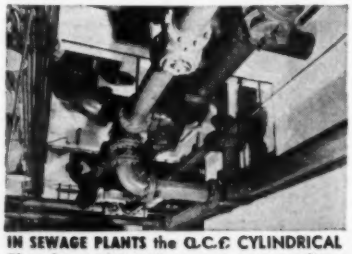


IN PETROLEUM and GAS INSTALLATIONS a.c.f. Valves give full-area flow with fast, positive shut-off.



IN SEWAGE PLANTS the a.c.f. CYLINDRICAL Plug shears obstructions on raw sewage lines ... provides uninterrupted flow.

a.c.f.'s Full Round Port, CYLINDRICAL Plug Valve has a straight level-through flow passage the same size and shape as the pipe itself! This means fast unobstructed flow of heavy or viscous ladings, solids in suspension, all liquids and gases.

And—there is full straight-through pipe area in a.c.f.'s Rectangular Port, CYLINDRICAL Plug Valve, too.

Investigate—you need "full pipe size area" valves for economical processing.

a.c.f. CYLINDRICAL FULL PIPE AREA **PLUG VALVES**

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Representatives in 50 Principal Cities

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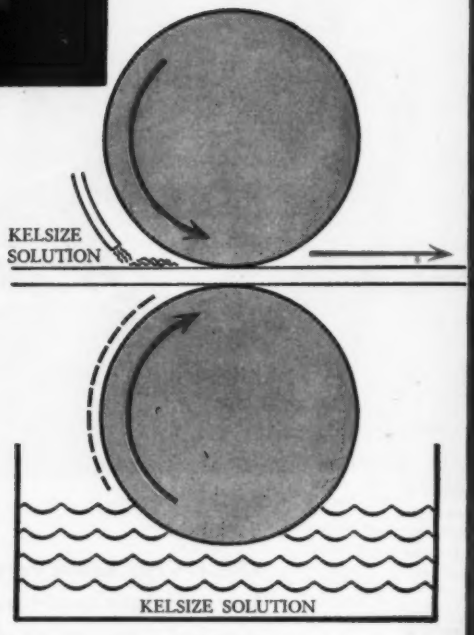
Kelsize and Kelgin are applied as a 0.2% to 3.5% solution from calender stack or size press.



Outstanding advantages

of these hydrophilic sizing agents are:

Uniformly Smooth Finish
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Gloss Ink Paperboard
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Butter Carton Stock
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Milk Bottle Stock
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Pigment Coated Wallboard
Excellent Fuzz Lay-down

Our Technical Service Department will gladly give you detailed information on the advantages of Kelsize and Kelgin in these and similar uses. Write or call our nearest office.

KELSIZE® and KELGIN®

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Cable address: KELCOALGIN — New York ®by Kelco Company

This is Controlled Volume Pumping
An automatic alum dilution system in which 450 gallons per hour of concentrated alum solution is pumped to dilution water to give dilute alum size. Discharge Pressure: 50 psi.
THIS MILTON ROY CONTROLLED VOLUME PUMP DOES THE JOB . . .

This automatic alum dilution system is only *one* application for Milton Roy Controlled Volume Pumps. Elsewhere in the paper industry, these units are used in automatic systems of rosin size emulsification, automatic caustic dilution systems, slime control, continuous pulp digestion—with measurable returns in accuracy, efficiency, and dollar savings. They have further application as components of blending and formulating systems, for precise metering of additives, automatic pH control, and for operations requiring the constant feeding of chemicals. They handle practically any liquid —slurries, viscous materials, fibres in suspension, acids, alkalies. As air-powered or motor-driven units, as components of automatic systems, complete with a variety of automatic controls, these pumps put processing operations on an accurate, automatic basis.

For detailed information, call the Milton Roy representative listed in your classified telephone directory. Or write us direct.

WITH THE EXCLUSIVE STEP-VALVE DESIGN

MILTON Roy COMPANY

1316 EAST MERMAID LANE, PHILADELPHIA 18, PA.

MANUFACTURERS OF CONTROLLED VOLUME PUMPS AND AUTOMATIC CHEMICAL FEED SYSTEMS

THERE IS NO SUBSTITUTE FOR PROVEN PERFORMANCE!

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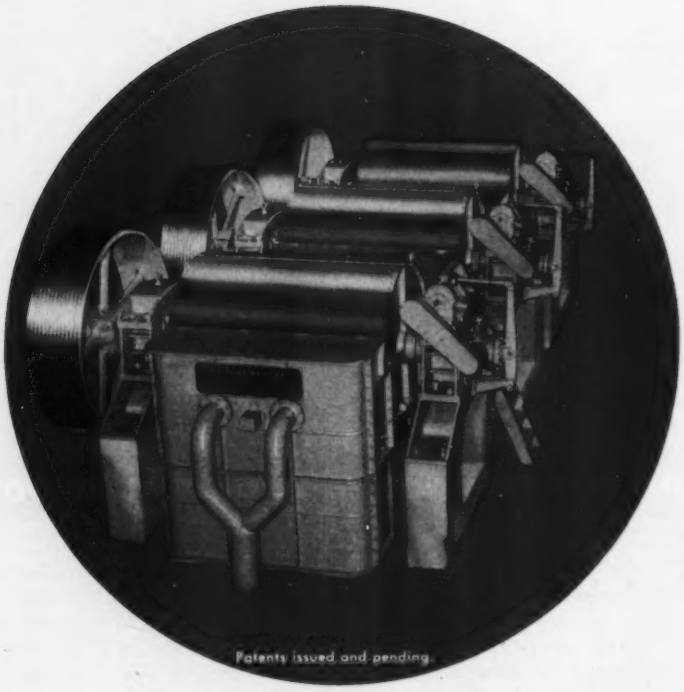

ONLY *PERFORMANCE ON THE JOB* CAN PROVE A BEATER!

PROVEN! Highest effective, predictable refining capacity. Roll has greatest possible number of bars. Stock spread in even film across full face of roll in continuous flow; untreated stock cannot pass through. Single Roll treats batches as small as 500 pounds, Multi-Roll as much as 200 tons or more per day — 1000 gallons per minute if desired.

PROVEN! Pressurized bedplates exert hydraulically-controlled *upward* pressures up to 40 tons, an impossibility in any other beaters!

PROVEN! Flexibility of design and completely automatic controls allow "tailored to your plant" installation. Can be made in stainless steel. Many types of stock chests in use on other floors, above or below Victory Beaters. Motors can be mounted at top to conserve floor space if desired. Shipped complete on flatcars, ready to install.

PROVEN! Costs less to operate on equivalent stock than any other beater ever installed in any paper mill in the world . . . reflecting the experience of a half century of pioneering in the manufacture of paper mill machinery.

VICTORY BEATER

can offer *facts* like these:

•FIRST IN THE FIELD, *ALONE IN EXPERIENCE!*

•THE ONLY BEATERS OF THEIR TYPE IN ACTUAL OPERATION!

•EXCLUSIVE, PATENTED FEATURES *PROVEN* ON THE JOB!

In 1946, The Noble & Wood Machine Company announced the first and only radical, major change in beater design and construction in 336 years. In 1946 the first Single Roll *Controlled Flow* Victory Beater was delivered to a New England fine paper mill. It is still hard at work, 100% efficient . . . the first of many Victory Beaters that *earned* their welcome in the industry.

In 1949, a Multi-Roll *Controlled Flow* Victory Beater roared into action in a Florida Kraft mill. Today, after more than 26,000 hours of *continuous operation* (over 3 solid years, day and night without a shutdown for mechanical difficulties!) this powerful triplex unit is still operating as efficiently as the day it started. Impressive proof? The mill thought so and installed 2 more Victory Beater triplex units.

In other mills in various parts of the world, Noble & Wood Victory Beaters — the first and *only* beaters of their type in actual operation — tested and proven since 1946 — are *on the job.*

Remember, *there is no substitute for proven performance.* We respectfully invite your inquiries and will supply you with immediate information. You can appraise for yourself, on the basis of actual record, the potential value of the Victory Beater in your papermaking operation.

THE NOBLE & WOOD MACHINE CO.

Paper Mill Machinery

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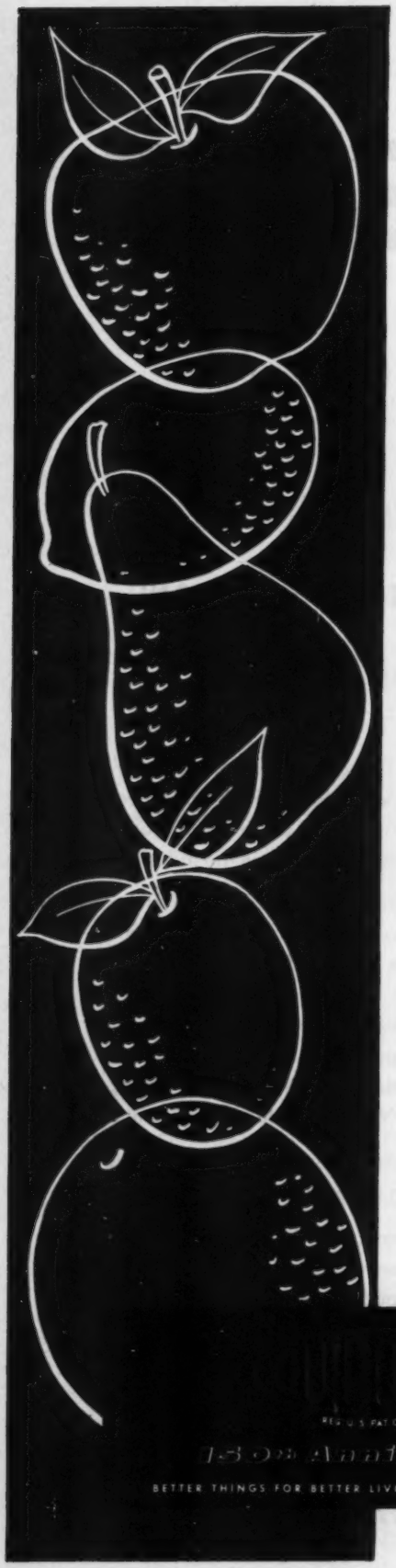

COLOR sells more produce ...helps you sell more produce men!

HERE'S COLOR that does a sales job and a product-identification job at the same time. It's an exclusive for fiber boxes... only with these containers is it practical to repeat the outside color on the inside, too.

When you show such containers to produce men, point out how a blue inside enhances the red of the tomatoes... or how a green sets off the yellow of the lemons. This added sales appeal can pay off at the produce counter when the boxes are used for display.

This "inside-outside" sales story for color is well worth passing along. And as for the proper choice of dyes... well, Du Pont alone offers you hundreds of shades in colors to choose from. Our Technical Staff will help you in your selection for each specific application. Just write: E. I. du Pont de Nemours & Co. (Inc.), Dyes and Chemicals Division, Wilmington 98, Delaware.

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150th Anniversary

BETTER THINGS FOR BETTER LIVING THROUGH CHEMISTRY

Du Pont Dyes

If better valves
could be made,
POWELL would make them
This is no idle boast because, for more than a century, Powell has been satisfying the demands of industry for the best valves it is possible to produce. As a result, Powell Valves have an enviable reputation for dependable service, long life and minimum maintenance.
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POWELL
BRONZE, IRON, STEEL AND CORROSION-RESISTING VALVES
DEPENDABLE VALVES
SINCE 1846

May I borrow your tux, Joe?

That's ridiculous. The chap in the chair wears a "36 Regular"... the lank lad in the doorway, to get a *good* fit, probably has to have his suits tailor-made.

That's why Anheuser-Busch offers you both a complete line of *standard* starches and corn products for paper mill use . . . and also provides a *special-formula* corn product, tailor-made for particular requirements. To help you determine which *is* best for each process, the services of the Anheuser-Busch technical and research departments are yours for the asking.

And, standard *or* special, all products bearing the Anheuser-Busch name assure you of the dependability and uniformity that have *built* our world-famous reputation for highest quality.

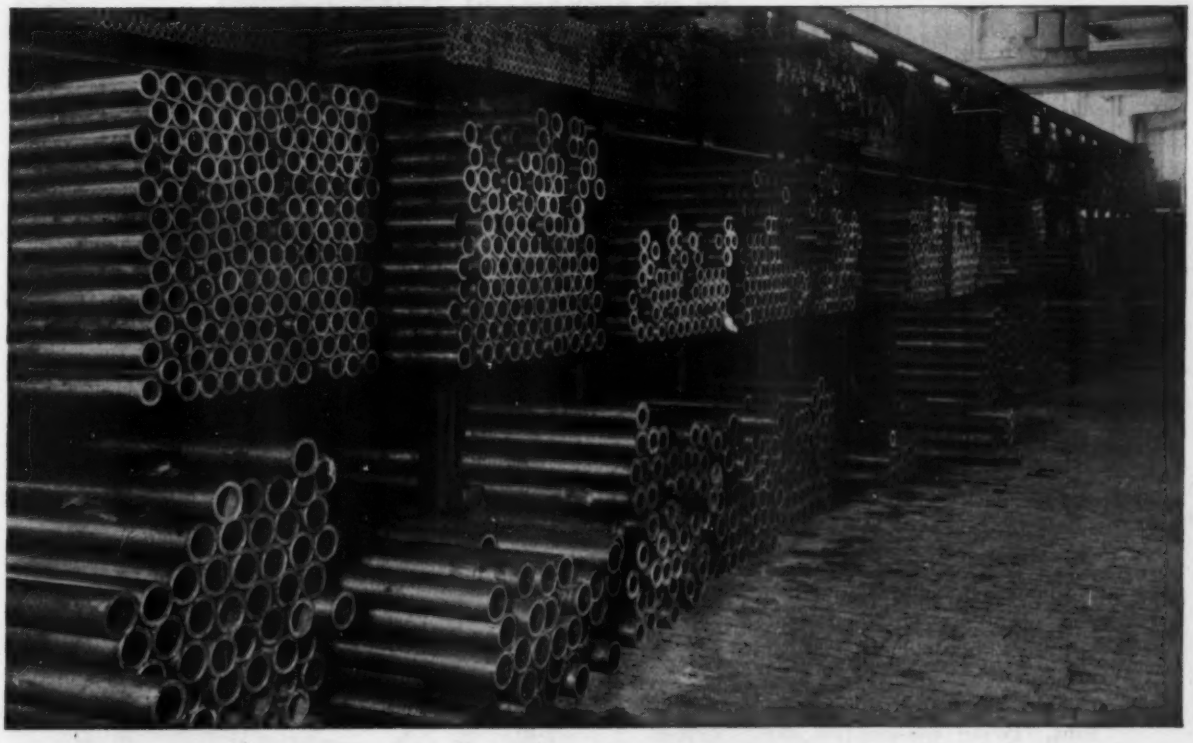
FURTHER INFORMATION PHONE OR WRITE

ANHEUSER-BUSCH, INC.

CORN PRODUCTS DEPARTMENT

ST. LOUIS, MO.

Order wear-resistant 52100 tubing today



. . . we ship it from here tomorrow!

IF you're in a hurry for wear-resistant 52100 tubing, phone, wire or write the Timken Company. Shipment will be made from mill stock within 24 hours after receipt of your order!

52100 steel tubing manufactured by the Timken Company can be heat treated to file hardness and tempered back to any desired point. A high carbon chrome steel, it is through-hardening in moderate sections and can often be used in place of more expensive steels. It's available in a wide range of sizes from 1″ to 10½″ O.D.

Timken® 52100 tubing will do many of your hollow parts jobs: aircraft parts, ball bearings, pump parts and plungers, collets, bushings, spindles, grinding machine parts and precision instrument parts, to name a few.

As America's earliest and foremost producer of 52100 tubing, the Timken Company has unequalled experience that results in uniform high quality from tube to tube and order to order. Rigid quality control checks every step of production.

For immediate delivery of your less-than-mill-quantity orders, write, wire or call The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

EASILY HANDLES 3000 POUNDS OF BROKE PER HOUR
on an economical 35-40-h.p.

E.D. Jones No. 1 Pulp-Master

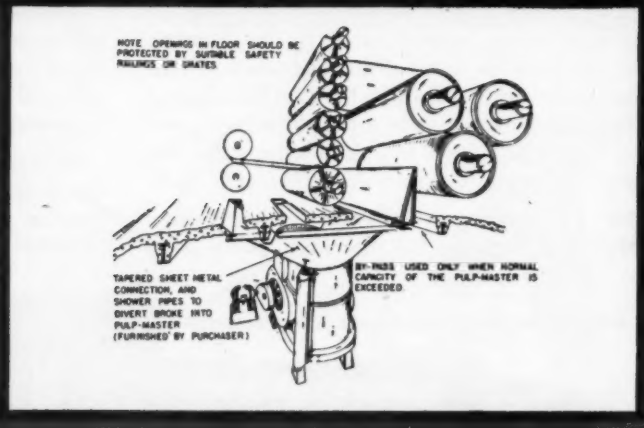
Ideal for installation under your paper machine, the Jones No. 1 Pulp-Master will easily handle 3000 lbs. of broke per hour, extracting completely pulped stock continuously through non-clogging perforated plates. *Slabs?* — sure, slabs up to the full width of your machine can be dropped or thrown in, and are almost instantly disintegrated.

Simple and fool-proof in design and operation, it requires no operators beyond the regular machine crew, and is free from troublesome maintenance problems. Power consumption, an economical 35 to 40 h.p.

Three other sizes of Jones Pulp-Master are available with capacities up to 4000 lbs. at 6½% or even higher densities, for batch or continuous operation.

Illustrated above in stainless steel, the No. 1 Pulp-Master is also available in regular carbon steel or for economical tile tank construction.

Delivered completely assembled, it is readily anchored in position (see suggested plan at right), piped up and connected to driving motor, ready to do a truly amazing job of pulping broke continuously.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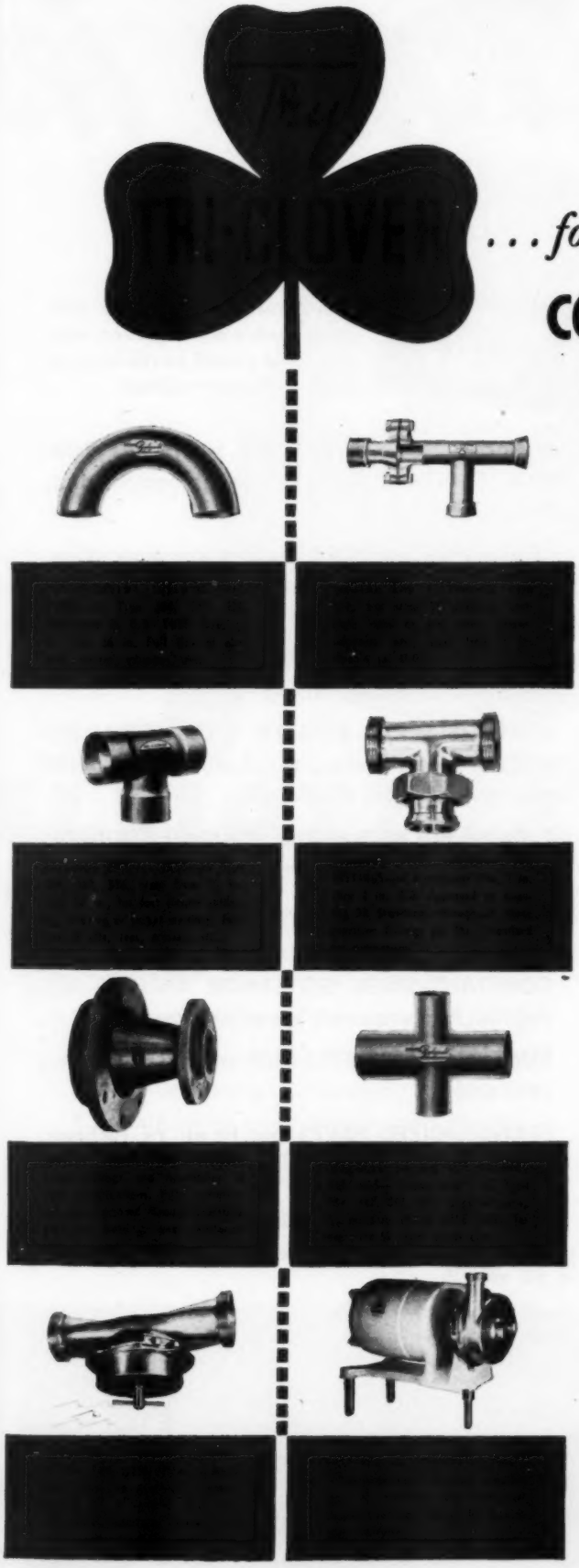
TAPERED SHEET METAL CONNECTION, AND SHOWER PIPES TO DIVERT BROKE INTO PULP-MASTER (FURNISHED BY PURCHASER)
BY-PASS USED ONLY WHEN NORMAL CAPACITY OF THE PULP-MASTER IS EXCEEDED

Ask your Jones representative for full details of the Pulp-Master Line, or write us for Bulletin EDJ-1019 B.

E.D. Jones

E. D. Jones & Sons Company, Pittsfield, Mass.

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY



. . . for the best solution to your

CORROSION-RESISTANT PIPING PROBLEMS

TRI-CLOVER offers 32 years of specialized experience in solving sanitary and industrial corrosion-resistant piping problems. Skilled craftsmen and engineers in four completely equipped plants have made the name *Tri-Clover* on stainless steel and alloy fittings, valves, pumps, and specialties signify unexcelled performance.

Your selection of the *right* fitting, valve, pump, tubing or pipe for the *right* job is made easier by Tri-Clover's complete production and engineering facilities. Benefit from this fact. For here is one dependable source . . . one responsibility for your sanitary and industrial piping problems.

Our experienced engineering service is at your disposal to help solve your specific corrosion-resistant piping problems.

Tri-Clover®
MACHINE CO.
Kenosha, Wisconsin

TRIALLOY AND STAINLESS STEEL SANITARY FITTINGS, VALVES, PUMPS, TUBING, SPECIALTIES

THE Complete LINE

FABRICATED STAINLESS STEEL INDUSTRIAL FITTINGS AND INDUSTRIAL PUMPS

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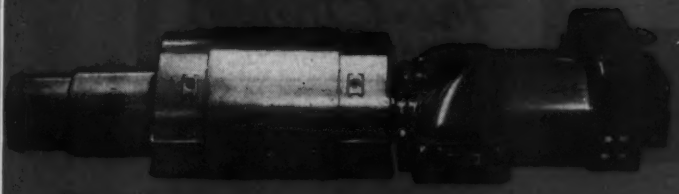
ELLIOTT
equipment for power and process

Deaerating Heaters

Condensers

Generators for Diesels



Turbine Generators

Large Motors

Centrifugal Blowers

Tops in

HERE'S WHY

this Elliott turbine is the natural choice among men who demand sound performance with low maintenance:

AIRWALL LABYRINTH SEALS WITH NO RUBBING CONTACT protect bearings against dust, fly ash, etc.—

CENTERLINE SUPPORT assures constant alignment at all times, irrespective of possible expansion due to temperature changes—

PACKING GLANDS REMOVABLE without raising upper half of turbine casing—

SHAFT IS SPRAY-COATED WITH STAINLESS STEEL under the packing gland, eliminating special maintenance after shutdown—

TURBINE BUCKETS AND SHROUD OF STAINLESS STEEL for maximum life and sustained efficiency—

ROTORS DYNAMICALLY BALANCED for smooth operation—

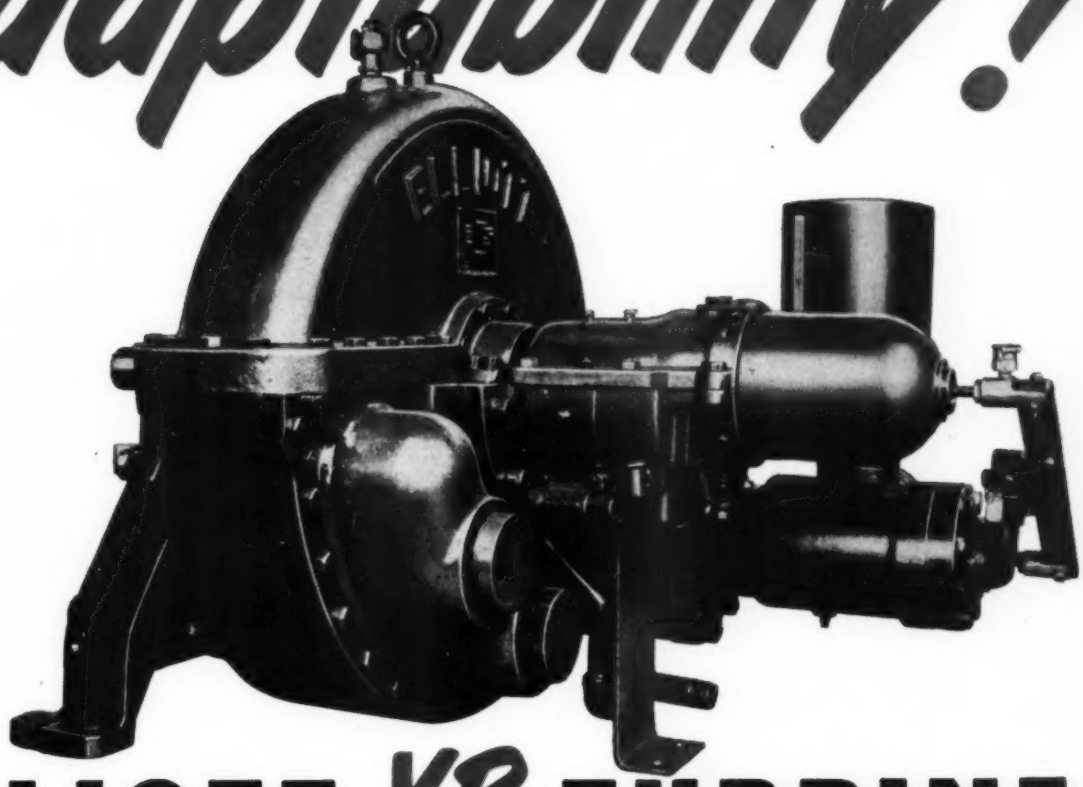
CONSTANT-SPEED GOVERNOR READILY ADJUSTED for permanent speed change—

BUILT-IN STEAM STRAINER of heavy stainless steel and

STANDARDIZED PARTS that fit all YR Turbines, greatly reducing parts inventory.

Bulletin H-16 has the full story. Phone or write your nearest Elliott office.

adaptability!



ELLIOTT YR TURBINE

HERE'S WHY ***this popular turbine can be adapted to practically any operating conditions:***

- **Six elective control devices, including:**
  1. *Two handvalves controlling nozzling*
  2. *Hand-operated speed changer*
  3. *Remote control speed changer, air or electric*
  4. *High exhaust-pressure trip*
  5. *Remote control electrical trip*
  6. *Hand throttled emergency trip valve.*
- **Five frame sizes**
- **Eight different turbine types**
- **Your choice of several governors each independent of the standard overspeed governor**
- **Gland seal piping for condensing operation, or operation with gas**
- **Exhaust connection on either side**

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Steam Turbine Dept. • **JEANNETTE, PA.**

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The CLOTHING is on the Machine...

Making paper or board is watery business. That is why machine tenders don't wear their Sunday clothes on the job.

But take a look at the machine! Fully clothed in wire and wool. Most of the water is removed from the sheet by suction through the wire clothing. The rest is pressed and sucked out through the open spaces between the threads of the felts.

One reason why so many mills prefer Hamilton Felts is because Hamiltons remove so much water in such a little time. Another reason is because Hamilton Felts leave no felt marks to mar the fine finish of the sheets.

Consult the Hamilton Sales Engineer before you change the clothing or the speed of your machines.

Hamilton Felts

MIAMI WOOLEN MILLS

Established 1858

SHULER & BENNINGHOFEN, HAMILTON, OHIO

foam costs money . . . it adversely affects the appearance and formation of the sheet. Further, it can cause breaks on the machine or slower machine speeds, resulting in lost production. Foam can also cost added dollars in plant housekeeping and safety.

Hercules offers a complete line of rapid-acting defoamers and eveners for paper and paper coatings, including the first defoamer to be made in convenient, solid brick form.

Write for details, describing your foaming problems. Our technical service staff will be glad to work with you in selecting the right material for the job.

Paper Makers Chemical Department

HERCULES POWDER COMPANY
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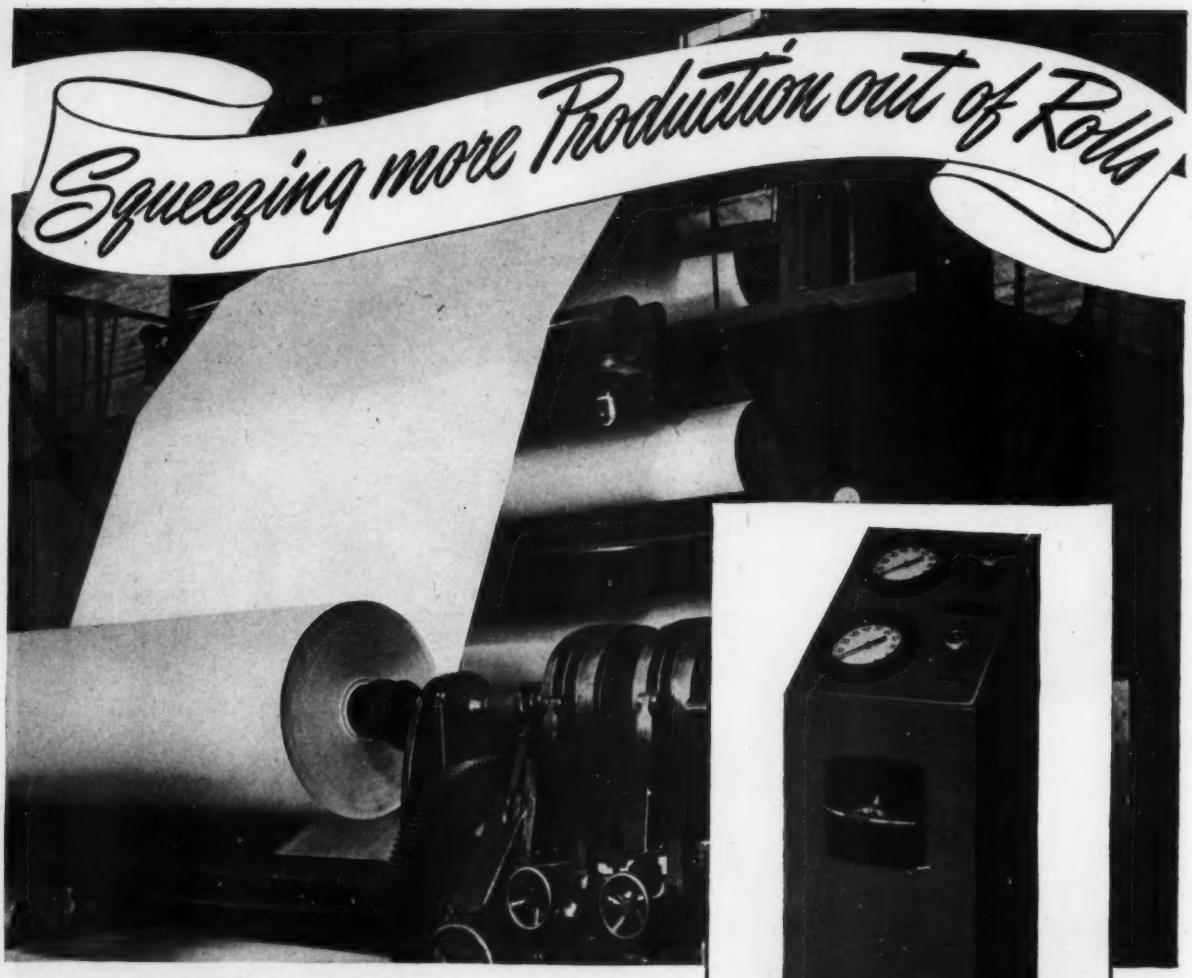
SIZING MATERIALS AND CHEMICALS FOR PAPER

PP52-8



FOXBORO PNEUMATIC LOADING

• On calenders, Foxboro Pneumatic Loading maintains better and more uniform finish . . . with fewer breaks. On press rolls, it assures maximum moisture extraction, and uniform extraction across the sheet.

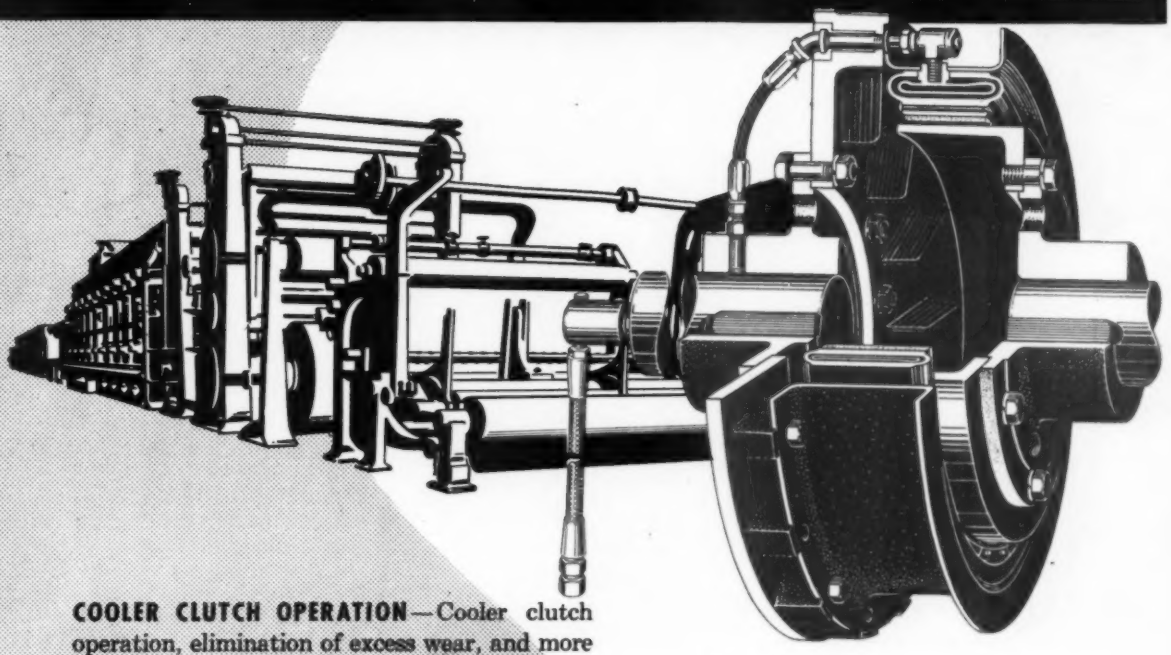
This modern roll-loading system gives calibrated cushioned roll pressure with convenient fingertip control . . . a turn of an air switch to load, unload, or lift the roll; a turn of two knobs to adjust exact pressure at each end of roll. Then, constantly uniform air pressure compensates for variations in material thickness, and for out-of-roundness of rolls — snubs tendency to bounce. Thus higher roll speeds with less broke are practical.

Bulletin B306 details this proven method for improving quality, for extending felt and roll life, and for saving steam. Bulletin 446 describes the exclusive STABILOAD CYLINDER which banishes friction and air leakage. Write for your copy today! **The Foxboro Company, 8212 Neponset Ave., Foxboro, Mass., U.S.A.**

In this new, streamlined Foxboro Control Cabinet, adjustments in load, venting, and reloading of air cylinders, or lifting of the top roll, are accomplished without lost time or physical effort. Cabinets are available in single and dual units. Instruments for remote recording of loading pressures can also be supplied.

FOXBORO REG. U. S. PAT. OFF. **PNEUMATIC LOADING**

FAWICK BRINGS 4-POINT SUPERIORITY TO PAPER MILL DRIVES



The advanced FAWICK AIRFLEX Type CB CLUTCH with the exclusive ventilated adapter.

COOLER CLUTCH OPERATION—Cooler clutch operation, elimination of excess wear, and more dependable sectional drive performance all result from the simple rugged design of the FAWICK CLUTCH and its exclusive ventilated adapter.

CUSHIONED POSITIVE ACTION—Unmatched operating smoothness and dependable clutch operation are provided through the shock-absorbing flexibility of the FAWICK rubber operating tube and the 360° constant-velocity contact of the friction surface.

SELF-ADJUSTMENT—The simple, rugged FAWICK design automatically adjusts itself for wear, insuring "new clutch" action at all times.

LOW MAINTENANCE—The elimination of mechanical operating linkage, adjustments, and lubrication make FAWICK unparalleled in low maintenance costs. Insure your mill the best operation with FAWICK AIRFLEX CLUTCHES on all your paper mill drives.

For further information on Fawick Industrial Clutch and Brake Units, write to the Main Office, Cleveland, Ohio, for Bulletin 400-A.

FAWICK AIRFLEX DIVISION
FEDERAL FAWICK CORPORATION
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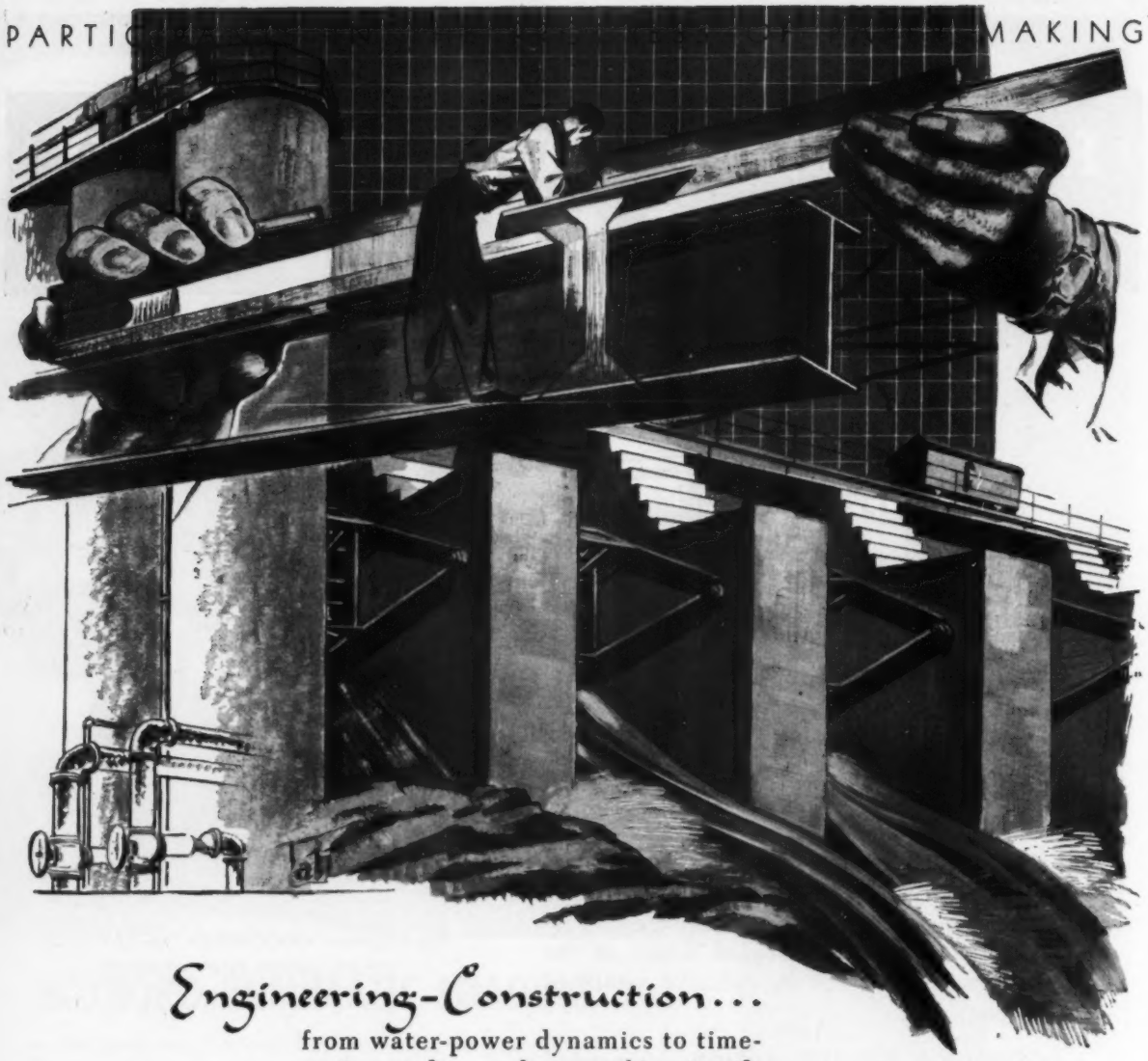
FAWICK Airflex
INDUSTRIAL CLUTCHES AND BRAKES

INSURE PEAK PRODUCTION ON YOUR PAPER MILL DRIVES WITH FAWICK

PARTI[illegible]MAKING



Engineering-Construction...

from water-power dynamics to time-motion study . . . from machine specification to complete structural design . . . engineering-construction helps keep the paper industry *ahead* of mere modernity!

Fourdrinier Wires...

as fabricated for 56 years by Appleton Wire Works, Inc., integrate priceless experience with tireless research . . . resulting in the *earned* reputation that *"Appleton Wires are Good Wires!"*

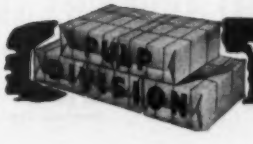
APPLETON WIRE WORKS, INCORPORATED • APPLETON, WISCONSIN

80 years ••• until harvest time!

Douglas fir forests, which supply raw material for most of Weyerhaeuser's mill sites, require 80 years to grow a seedling into a tree of mature size. Contrary to popular belief, only a small part of the total program of reforestation is accomplished by artificial planting and seeding. The primary reforestation job is the restocking of cut over land as old growth timber is harvested. This is being done by natural reforestation with seed supplied from blocks of trees reserved during logging and left standing to reseed the adjacent cut-over area. Where natural seed sources have failed, artificial reforestation by sowing tree seeds with helicopters or mechanical seeders is used.

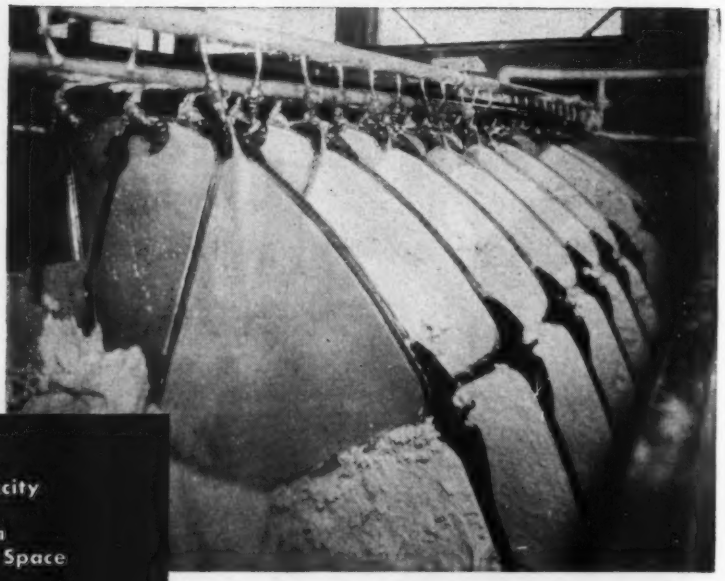
As more and more virgin timber stands are logged in the forests under Weyerhaeuser management, the harvested land begins growing new trees. As the supply of mature timber diminishes, it will be replaced by a steadily increasing volume of new growth.

There are good possibilities of increasing the yield from this land through silvaculture research and intensified forestry and harvesting practices. Thus Weyerhaeuser's twin goals are a *sustained* and *increased* yield of cellulose products from its 2,500,000 acres of timber land.



WEYERHAEUSER

AMERICAN
Disc-Type SAVEALL



- ✓ High over-all Capacity
- ✓ Greater Filter Area per sq. ft. of Floor Space
- ✓ The Ideal Unit for Stepped-up Production

American Disc-Type Saveall recently installed in the Chester, Pa., mill of the Scott Paper Company. Note the water jets peeling off the sheet from individual sectors.

Looking into the future, many paper mills are likely to be confronted with a "space" problem. How about your mill? Are you planning to

a...speed up your paper machines
b...install additional or larger machines
c...operate with greater tonnages of slower stock
d...reduce stock losses

To carry out any one of these plans will involve handling greater volumes of white water which may be beyond the capacity of the largest single drum type Saveall. If floor space is no problem, you can make your choice between the Oliver Drum Type Saveall and the American Disc-Type Saveall. BUT, if extra floor space is either non-existent or set aside for other purposes, look into the merits of the American Saveall.

The largest American can provide a filtering area approximately three times that of the largest Oliver drum type unit yet requires only approximately the same floor area. It has exceptionally high dewatering efficiency. It will give you the highest capacity for a limited floor area. It provides greatest flexibility in filtering area.

An Oliver United Engineer, well experienced in Saveall problems, will be glad to discuss the American Filter in relation to your limited floor space problem.

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A New Major Source of Hydrogen Peroxide

It is of little importance that this is a picture of "our new factory."

It *is* important that it is the first major expansion in the country's hydrogen peroxide facilities in a long time.

Becco aims to prevent the recurrence of hydrogen peroxide shortages which have plagued the country during recent years.

Becco's new Vancouver, Wash., plant is now in full production of hydrogen peroxide and other

peroxygen chemicals. This will afford quicker deliveries to the Western area and enhance our Buffalo plant's service to the Southern, Central and Eastern areas.

BECCO

HYDROGEN PEROXIDE AND OTHER PEROXYGEN CHEMICALS

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DIVISION OF FOOD MACHINERY AND CHEMICAL CORPORATION

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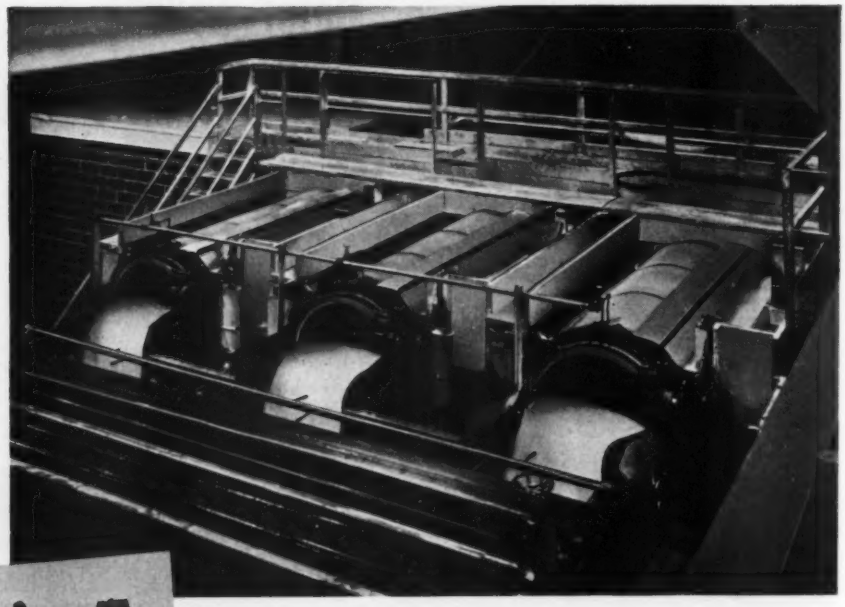
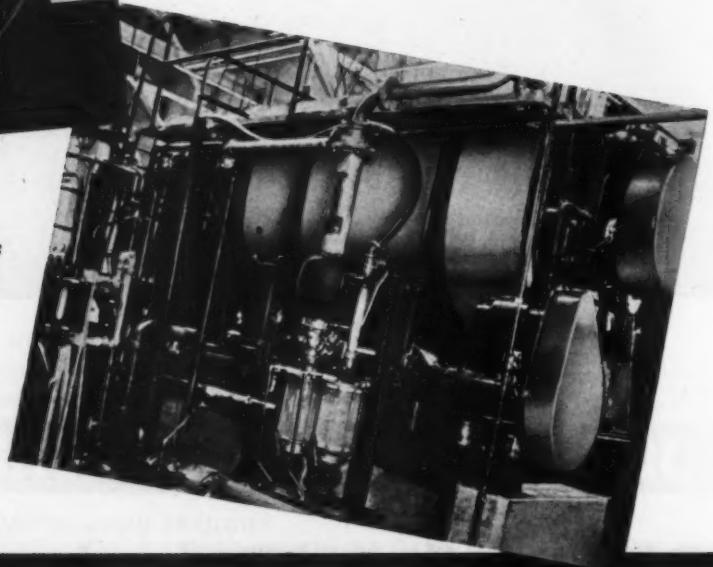
YOU NEED BIG, MODERN BIRD SCREENS



—with the capacity to take care of today's paper machine speeds and feeds.

—with the ample screening area to permit finest possible screen slots for your grades of stock.

—with the Bird Oscillating Shower Pipe to keep the screen slots clean and open while using only a small fraction of the water required with ordinary showers.



—with Dirtec tailings units which handle screen tailings as fast as they collect (seven tons per screen per day) remove all the dirt and return the clean stock with negligible fibre loss.

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

The Paper Industry

December 1952

The Season's Greetings

This is the season of expression and practice of good-will and the exchange of greetings, a custom very much in character with the way of life in all countries comprising the Free World. Our heritage of culture and civilization has endowed us with the belief that social relations, business transactions, government administration, international problems are best tackled on a basis of mutual respect and friendship rather than in an atmosphere of slander, intimidation, and terror.

In our way of thinking, there is room for such concepts as the rights and dignity of man. We shall never agree to the Kremlin's negation of these principles that reduces the individual to a terrorized nonentity devoid of self-respect and incapable of independent thought or action. Our way of life prerequires a sense of humor—we recognize inadequacies in both the governing and the governed—in place of a stiff, irreconcilable attitude that recognizes inadequacies in the governed only.

The flexibility of our system and our preference for friendly relationships are often mistaken for weakness by governments that exercise dictatorial powers. What naiveté! It does not take too much research in the study of human behavior to realize that the practice of friendly relations—in accord with our responsibilities to mankind and civilization—requires a degree of discipline and sustained courage no governing system based on terror could ever hope to duplicate.

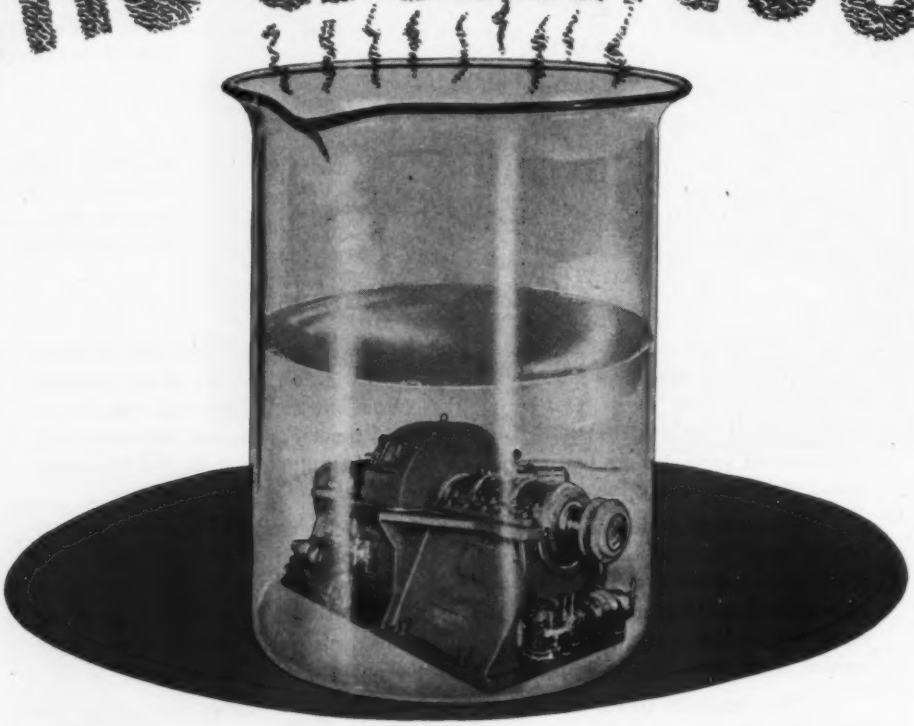
We have just witnessed a recurrence of a communist-instituted purge in Prague implemented along a too familiar pattern: the same accusations and the same unnatural readiness to confess on the part of the accused. The confessions are no longer surprising; in fact, they are predictable with 100 per cent accuracy. What is surprising is that the Kremlin does not credit us, or its own people, with a little more intelligence. But true intelligence may be an attribute which is not easily recognized under a Communist system so richly endowed with party-line dialectics and other limitations.

In line with these sentiments, we wish to pay special tribute to Radio Free Europe and Radio Free Asia, who have had remarkable success in penetrating the Iron Curtain to let in light and new hope for a large segment of humanity now held in bondage.

By the way, have you signed the Freedom-Gram on page 1038, November issue of The PAPER INDUSTRY?

A. W. J. DYCK

The acid test



You can profit from the experience of the papermakers who've given Sutherlands the acid test of rigorous mill operation. On one tough job after another, Sutherlands have consistently improved quality, increased tonnages, and lowered costs. Your mill can benefit from the same solid understanding of stock preparation problems that made these results possible. Get the advice of your Sutherland engineer—it's yours for the asking. Write or wire us today.

SUTHERLAND

Sutherlands are manufactured in the United States by Valley Iron Works Company, Appleton, Wisconsin

continuous beating systems

Designed, Engineered, Serviced

by SUTHERLAND REFINER CORPORATION

TRENTON 8, N. J.

The Paper Industry Current Comment

Election repercussions . . . wastepaper . . . and normal profits

Although the incoming of a Republican administration presages a less hostile attitude toward business than was evident in previous years, the American paper industry, while hoping for amelioration of the excessive tax burden, is facing other conditions less promising. The Republican platform pledging a continuance of the Reciprocal Trade Agreement Act is being seized upon by low tariff advocates as the basis for a renewed drive for still lower tariff rates.

Witness the address at the annual convention of the National Foreign Trade Council at New York the week of November 17, when a speaker called for tariff rate revisions, even though such revisions might mean that a few domestic industries may have to "decline and die." At the same convention a New York banker stated that regardless of previous duty rate reductions, this country should still further reduce many rates as an encouragement for imports, and that the only alternative to this was continued hand-outs to foreign nations.

A. B. Sparboe, vice president of Pillsbury Mills, said "the time has finally come when we must make certain painful economic adjustments even if it means having a few of our domestic industries decline and die." He intimated that the Government should buy and close out non-competitive marginal producers.

Winthrop W. Aldrich, chairman of the Chase National Bank, said that rate reductions under the Trade Agreement Act had not gone far enough and criticised those industries which have sought relief under the "escape clauses" of the trade agreements already negotiated.

Painful experience

The paper industry has had painful experience with legislation which allowed domestic industry to "decline and die." In the case of newsprint, under a similar program at least half of our 70 domestic newsprint mills declined and died; only a dozen mills survived as newsprint producers. The only new mills built in 40 years to make this grade of paper are those financed by newspaper publisher cooperatives.

Price-fixing?

Another slant on the foreign trade situation comes from Canada, where the minister of justice published a report accusing the entire $50,000,000 fine paper industry in Canada of operating an illegal price-fixing combine. After a four-year investigation, the combine's commissioner, T. D. MacDonald, has suggested that a reduction of duty rates on such papers might be one way of infusing competition into an industry which has allegedly maintained combines for 17 years.

Without relying on a crystal ball to forecast other results of the election upheaval, one of the cabinet announcements of the President-elect has a direct bearing on a problem which has been troubling the paper industry. The appointment of Governor McKay of Oregon as the new Secretary of the Interior puts into office a man who has positive ideas on the subject of reclamation and water power projects. Governor McKay is a believer in local control of such projects to the maximum extent possible without injection of federal control. A nation-wide series of T.V.A. developments has been envisaged by the Democratic administration, with the Connecticut Valley as a possible target. The paper industry has gone on record with its own views on such a project for this important paper mill area. The views of Governor McKay appear to be exactly in line with the thinking of the Connecticut Valley paper mills.

Wastepaper use

The problem of wastepaper usage is being approached from an entirely new angle. The use of wastepaper rises and falls like the movements of ocean tides; there is always a feast or a famine. An entirely new organization is sponsored by members of the American Paper and Pulp Association and the National Paperboard Association. The Waste Paper Utilization Committee has been formed with Earl Weaver of International Paper Co. as its chairman and Henry J. Perry, editor of *Paper Trade Journal*, as a full-time secretary. Chemical concerns, paper and board manufacturers, publishers and other interested groups will participate in an effort to carry on a continuing program for elimination of present handicaps in the collection and preparation of waste for paper stock. Mr. Perry takes up his new work January 1 and brings to the task experience in the practical problems of paper mills. The new committee will devote most of its attention to problems other than maintaining a constant supply of this raw material.

Normal profits

That the paper industry is returning to a more normal profit status is shown by a survey by a New York financial paper of corporate profits of 240 corporations. There has been an average upswing in the third quarter as compared with the same quarter in 1951, though nine-month profits are still below those for the first nine months of 1951. The paper mills included in this survey earned 12.9 million dollars in the 1952 nine-month period, as against 18 million in 1951, a drop of 28.4 per cent. In the third quarter, however, the profits were 4.1 million, as against 5.1 million in that quarter of 1951, or a drop of only 19.6 per cent for that period. While this does not show undue prosperity, it does demonstrate an approach toward better days.

Criticism from within of the encroachments of government on business has been voiced by Lowell V. Mason, Federal Trade Commissioner. He says he has regarded such restrictions as a form of cancer and has had a premonition of evil days ahead. "I have been disturbed," he said, "at the apparent indifference of the business man in America to the gradual encroachment of bureaucratic power," and added that no matter what a business concern may do, it can be found guilty of some technical transgression of the law. Perhaps his

fear may be dissipated by the new look in the White House.

Financial Reports

Paper mill securities shared in the November upturn in stock and bond prices following the election. Averages for all securities reached close to record highs for many years past.

Net incomes

American Writing Paper Corp.—Net income for the first three quarters of 1952 was $201,953, as compared with $443,026 for the same period in 1951.

A.P.W. Products Co.—Net income for nine months ended September 30 was $68,024, as compared with $166,075 a year ago.

Celanese Corp. of America—Net income for the quarter ended September 30 was $5,484,150 as compared with $5,400,837 for the corresponding period last year.

Certain-Teed Products Corp.—Net income for the nine mohths ended September 30 was $2,814,686, compared to $3,737,463 for the same period in 1951.

Champion Paper & Fibre Co.—Net income for the quarter ended September 30 was $2,170,312 and for the six months to date $4,554,479, compared to $4,976,552 for the first six months of 1951.

Chesapeake Corp. of Virginia—Net nine months income was $1,762,534, as against $4,063,907 in 1951.

Consolidated Paper Corp. Ltd.—Net income for the six months ended June 30 was $5,417,072, compared with a net of $5,926,087 for the first half of last year.

Container Corp. of America—Net profit for the nine months to September 30 was $7,738,000, contrasted with $9,515,000 for the same period in 1951.

Crown Zellerbach Corp.—Net income for the quarter ended July 31 was $5,148,564, as compared to $5,944,876 in 1951.

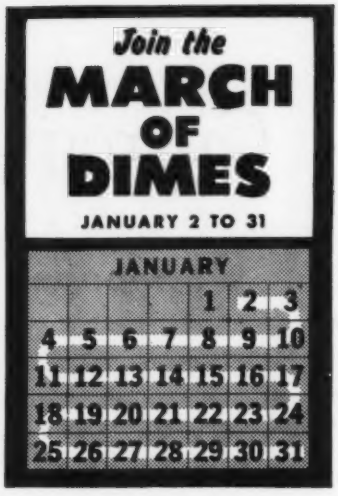
Crystal Tissue Co.—Net nine months income was $65,776, as compared with $228,440 in 1951.

Dixie Cup Co.—Net income for the nine months to October 30 was $1,890,827, compared with $2,161,915 a year ago.

Eastern Corp.—Net income for the first nine months ended September 30 was $768,330, compared with $1,615,583 last year.

Flintkote Co.—Net income for the 10 months ended October 4 was $3,680,294, as compared to $4,455,856 in the like 1951 period.

Gair (Robert) Co. Inc.—Combined net income for the first nine months was $4,107,265, compared with $5,014,801 last year.



Gaylord Container Corp.—Net income for the nine months ended September 30 was $5,554,848, compared with $6,245,512 a year ago.

General Box Co.—Net earnings for the first six months totaled $392,229, compared with $714,811 for the first six months of 1951.

Glatfelter (P. H.) Co.—Net income for nine months to September 30 was $505,255, compared with $521,115 last year.

Great Lakes Paper Co.—Net profit for three quarters ended September 30 was $2,021,237, compared with $3,464,729 a year ago.

Great Northern Paper Co.—Net profit for nine months to September 30 was $3,376,284, compared to $3,391,780 for the same period in 1951.

Hammermill Paper Co.—Net profit for the first nine months ended September 30 was $937,982, compared with $1,284,897 a year ago.

Hinde & Dauch Paper Co.—Net profit for nine months ended September 30 was $2,257,561, compared to $2,976,988 last year.

Imperial Paper & Color Corp.—Net income for the year to June 30 was $791,185, compared to $1,651,639 in the previous fiscal year.

International Paper Co.—Net profit for nine months ended September 30 was $36,587,661, compared to $42,602,321 for the same period last year.

Keyes Fibre Co.—Net income for nine months ended September 30 was $753,710, as compared with $967,059 for the same period in 1951.

Lily-Tulip Cup Corp.—Net profit for the nine months to September 30 was $2,193,388, compared to $2,590,247 last year.

Masonite Corp.—Net income for the year ended August 31 was $3,368,203, as compared with $3,789,324 for the previous fiscal year.

The Mead Corp.—Net profit for the 40 weeks ended October 5 was $3,439,949, as compared to $4,795,359 a year ago.

Minnesota & Ontario Paper Co.—Net income for the first nine months of the year was $3,836,197, compared with $3,962,439 a year ago.

Mosinee Paper Mills Co.—Net income for the year ended May 31 was $681,034, as compared with $851,422 for the preceding fiscal year.

National Vulcanized Fibre Co.—Net nine months income was $387,424, as compared with $1,202,804 a year ago.

Nekoosa-Edwards Paper Co.—Net income for the first nine months of the year was $1,370,000, compared with $1,441,000 last year.

Oswego Falls Corp.—Net income for nine months ended September 30 was $971,181, as compared with $816,911 a year ago.

Oxford Paper Co.—Net income for the nine months ended September 30 was $2,032,325, compared to $2,223,448 a year ago.

Pabco Products Inc.—Net profit for the quarter ended September 30 was $337,228, compared with $639,121 for the same quarter in 1951.

Puget Sound Pulp & Timber Co.—Net income for the first nine months was $2,039,867, compared with $2,848,788 a year ago.

Rayonier Inc.—Net income for the nine months ended September 30 was $8,427,590, compared with $8,759,274 last year.

Rhinelander Paper Co.—Net profit for the fiscal year ended September 30 was $1,443,618.

Riegel Paper Corp.—Net income for the first nine months was $679,148, compared with $1,023,231 last year.

St. Croix Paper Co.—Net income for six months ended June 30 was $445,024, as compared with $443,823 for the same months of 1951.

St. Lawrence Corp.—Net profit for the nine months to September 30 was $4,669,277, off from the $6,491,910 of a year ago.

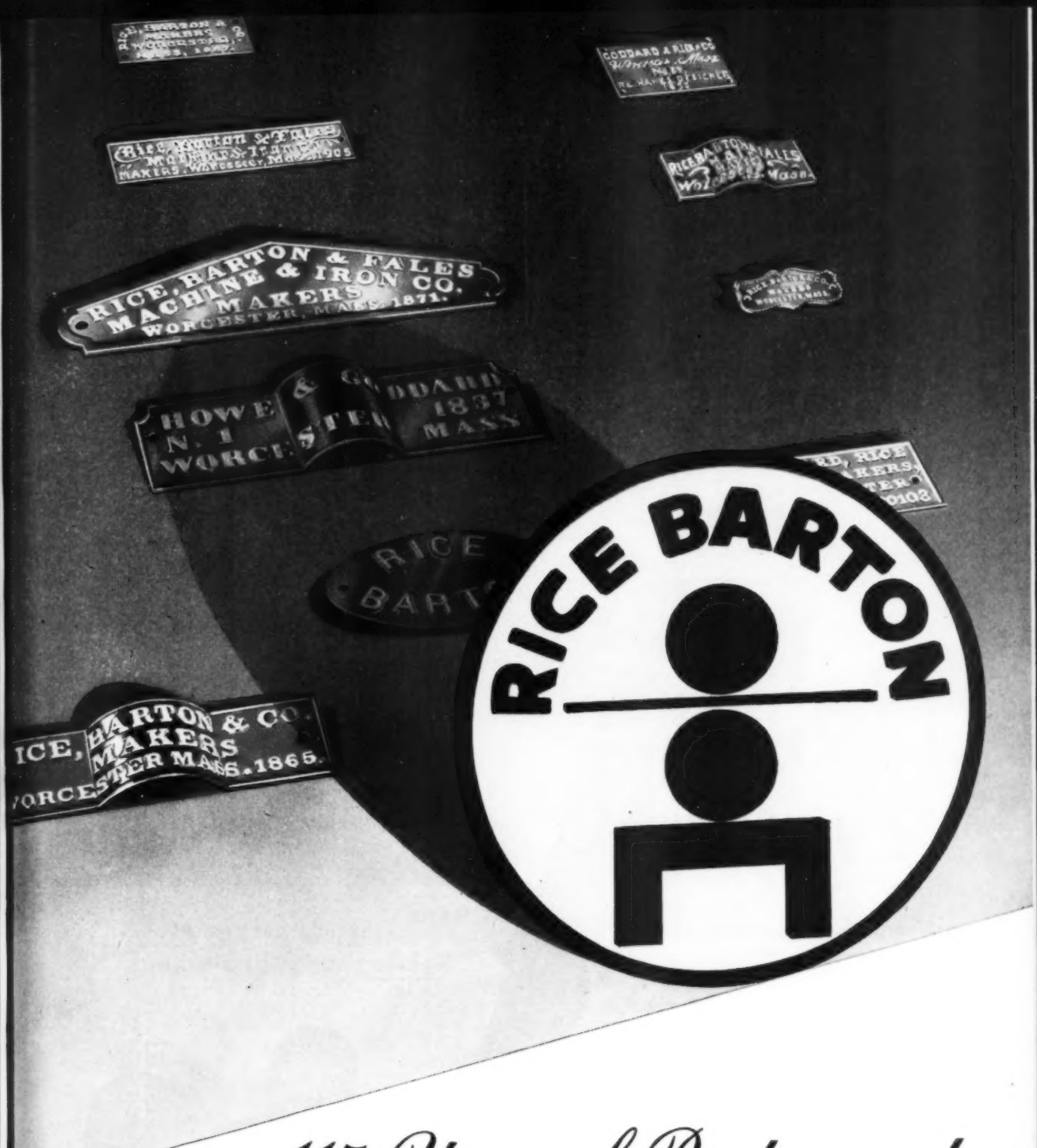
St. Regis Paper Co.—Net profit for the nine months ended September 30 was $8,555,863, compared to $12,796,676 for the same period a year ago.

Scott Paper Co.—Net income for the first nine months ended September 30 was $7,430,927, compared to $8,210,756 last year.

Seaboard Container Corp.—Net income for the six months ended June 30 was $245,600, compared with $661,300 a year ago.

Sorg Paper Co.—Net income for the first nine months was $138,698, compared to $517,759 a year ago.

Sutherland Paper Co.—Net profit for the nine months to September 30 was



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RB12-52

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$1,827,105, compared to $2,064,626 last year.

Union Bag & Paper Co.—Net income for the nine months to September 30 was $8,123,600, compared to $9,420,958 for the same period a year ago.

United Board & Carton Corp.—Net profit for the year to May 31 was $674,872, compared with $783,319 last year.

United States Envelope Co.—Net profit for the first half year was $382,708, as compared with $920,365 a year ago.

United Wallpaper Inc.—Net income for nine months ended September 30 was $30,397, as compared with a deficit of $212,418 for the period in 1951.

West Virginia Pulp & Paper Co.—Net income for the nine months ended July 31 was $7,981,000, as compared with $7,983,000 for the comparable period a year ago.

Weyerhaeuser Timber Co.—Net profit for the nine months ended September 30 was $27,846,217, compared with $30,383,100 last year.

Dividend declarations

American Boxboard Co. has declared a common stock dividend of 37½ cents a share, payable October 10 to stock of record September 24.

Certain-Teed Products Corp. has declared an extra of 12½ cents and the regular quarterly dividend of 25 cents on the common, both payable December 10 to stock of record December 1.

Dryden Paper Co. Ltd. has declared an extra 40-cent and the usual 40-cent quarterly dividend on the common, both payable November 1.

Eastern Corp. has declared a cash dividend of 25 cents per share payable December 1 to record of November 14.

Ex-Cell-O Corp. has declared a dividend of 50 cents a common share, payable October 1 to record of September 10.

Fibreboard Products Inc. has declared the regular quarterly dividend of $1.50 a share on the prior-preferred, payable November 1 to stock of record October 16.

Fox Paper Co. has declared a quarterly dividend of 50 cents a share on the common stock, payable September 13 to record of September 6.

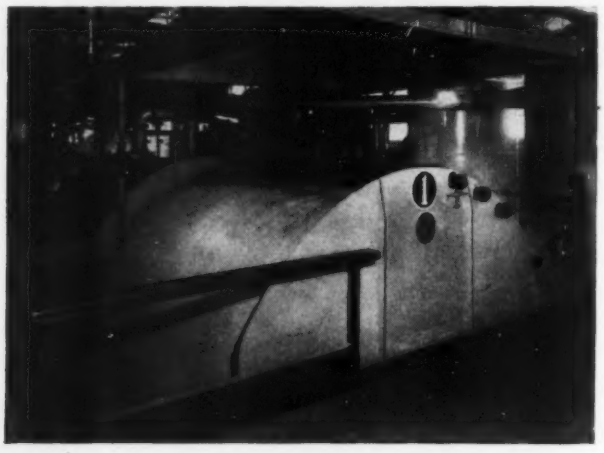
Gair (Robert) Co. Inc. has declared a quarterly dividend of 37½ cents per share on the common, payable December 10 to stock of record November 20.

Gaylord Container Corp. has declared a dividend of 37½ cents a share, payable September 10 to stock of record September 2.

Glatfelter (P. H.) Co. has declared a

CLEANER PULP

requires this combination



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W2-12

dividend of 56¼ cents per share on the $50 par value 4½ per cent preferred and a dividend of 25 cents per share on the common, both payable December 1 to stock of record October 15.

Hoberg Paper Mills has declared quarterly dividends of 37½ cents on the common and 34⅜ cents on the 5½ per cent convertible preferred, both payable October 1.

International Paper Co. has declared the regular quarterly dividends of $1 per share on the cumulative $4 preferred and 75 cents on the common, both payable December 15 to stock of record November 21.

Kimberly-Clark Corp. has declared regular quarterly dividends of $1 per share on the 4 per cent convertible preferred, payable February 2 to holders of record January 9, and 60 cents per share on the common, payable January 2 to stock of record December 10.

Lily-Tulip Cup Corp. has declared a dividend of 62½ cents per common share to stockholders of record September 2, payable September 15.

Marathon Corp. has declared a regular quarterly dividend of 30 cents on the common, payable November 29 to record of November 7, and a regular of $1.25 on the preferred, payable January 2 to record of December 19.

Mengel Co. has declared a quarterly dividend of 25 cents per common share, payable September 20 to stock of record September 2.

National Container Corp. has declared quarterly dividends of 25 cents per share on the common stock and 31¼ cents per share on the $1.25 convertible preferred, $25 par value, payable December 10 to record of November 20.

Northern Paper Mills has declared an extra of 50 cents and the regular quarterly dividend of $1 on the common, both payable December 10 to record of November 20.

Puget Sound Pulp & Timber Co. has declared a quarterly dividend of 50 cents on the common stock, payable December 20 to record of December 4.

Sutherland Paper Co. has declared a quarterly dividend of 37½ cents on the common, payable December 15 to holders of record November 14.

Union Bag & Paper Corp. has declared a regular quarterly common dividend of 75 cents and an extra dividend of 50 cents, both payable December 10 to record November 25.

United Board & Carton Corp. has declared a 25-cent dividend on the common, payable December 10 to record of November 20.

United States Gypsum Co. has declared an extra dividend of $2 on the common, plus the regular quarterly dividends of $1 on the common and $1.75 on the 7 per cent preferred.

West Virginia Pulp & Paper Co. has declared a year-end extra dividend of $2 a share on the common, payable October 15 to record of October 1.

Paper mill corporate changes

Bemis Bag Co. has borrowed $14,000,000 from insurance companies and banks to reduce its short-term borrowings and for general corporate purposes.

Canadian Chemical & Cellulose Co. has provided option for its executive employees to purchase 50,000 common shares at $15.50 each up to December 31, 1962.

Celanese Corp. of America 3½ per cent debentures, due October 1, 1976, in definitive form, are available in exchange for temporary debentures at the office of the Chase National Bank, New York, N. Y.

Fort Orange Paper Co. has been authorized to increase the number of shares of its common stock from 10,000 to 120,000. The increase is in effect a split of 10 for one, as only 100,000 of the new shares will be issued.

Fort Wayne Corrugated Paper Co. has announced the permanent closing of its strawboard mill operations in Vincennes, Ind., as soon as its present store of raw materials is exhausted. The decreasing demand for straw corrugating in the face of developments in other raw material fields for corrugation is ascribed as the reason, and the local farmers who have sold their wheat straw are thus deprived of their market.

Gair Co. Canada 4 per cent cumulative preferred first series shares were to be called for redemption November 12 at $102 a share plus accrued dividend of 80 cents. They were to be removed from trading at the close of business November 10, and transactions on November 7 and 10 were for cash relivery.

International Paper Co. has announced that holders of scrip for fractional shares, issued September 22, 1950, in connection with a stock dividend, are entitled to receive $13.92 for each quarter-share interest surrendered up until September 24, 1956. After that date, scrip will be void. Scrip was to be convertible into common stock only until September 22, 1952. Since then, Bankers Trust Co. has sold for $28,127.91 the 575 shares of stock held in escrow to cover remaining fractional interests. In addition, the trust company was holding $3,881.25 in dividends received on shares in escrow.

Kalamazoo Paper Co. figures in a secondary offering of 12,000 shares of common stock at 18½ by a banking organization.

Lee Paper Co. will increase its capital by the issuance of 30,000 shares of $10 stock, with three shares allocated to each present holder of 10 shares.

Mersey Paper Co. has increased capital by the creation of 14,000 common shares, par $100, and cancelled 38 unissued n.p.v. common shares. The firm has also resolved to (1) convert the additional 14,000 common shares, par $100, into preference shares ranking in all respects with the outstanding 5 per cent preference shares save only as to the date from which the preferential dividend accrues; (2) transfer $1,368,938 shown on the books as "capital redemption reserve funds" to the surplus account, reducing the reserve fund to nil, and (3) provide for a more convenient method of dealing with fractions of preference shares arising out of capitalization of profits and distribution of fully paid up shares among the shareholders.

National Gypsum Co. has completed the placing of a 25-year $25,000,000 loan, of which $18,500,000 will be used to retire outstanding indebtedness and the balance for capital expansion.

Robert Gair Co. Inc. has announced that its outstanding $20 par value 6 per cent cumulative preferred stock in the amount of $5,977,600 was retired at par as of September 30.

Sonoco Products Co. has purchased Gates Paper Co., makers of industrial paper products, but E. H. Southwell, president of Gates, will remain as general manager of the plant.

New York Stock Exchange—Stocks

	Closing Prices Nov. 20, 1952	Oct. 20, 1952
A.P.W. Products	4⅞	4⅞
Celotex	16⅝	15⅞
Same Preferred	* 16 – 16⅝	* 16¼–16½
Certain-teed Products	14⅜	13⅝
Champion P. & E. Co.	29½	28¼
Same Preferred	*103½–105	105
Chesapeake Corp.	30	30
Continental Diamond	11⅝	11⅛
Container Corp.	40	38½
Same Preferred	*102½–104	*102 –104
Crown Zellerbach	62¼	55
Same Preferred	102⅝	102⅛
Dixie Cup	35½	33
Eastern Corp.	17⅝	* 17 – 17½
Robert Gair	18	17½
Gaylord Container	27	* 26½– 26⅝
Hammermill	14⅝	14
International Paper	51⅝	48⅝
Same Preferred	*103 –105¼	102¼
Kimberly-Clark	47⅜	46½
MacAndrews & Forbes	* 41 – 41½	40½
Marathon	23⅝	24
Masonite	25½	22¼
Mead Corp.	23⅝	24¼
Same Preferred	* 88 – 89	* 83 – 88½
National Container	11⅛	11¼
Rayonier, Inc.	33	32⅝
Same Preferred	35	35¼
Scott Paper	55	51½
Same 3.40 Preferred	* 89 – 90½	* 87½– 89
Same $4 Preferred	*102¼–104	103
St. Regis	19	19¼
Same Preferred	90½	* 92 – 93½
Sutherland Paper	25⅝	25⅝
Same Preferred	*110 –112½	108
Union Bag & Paper	47	44¼
United Board & Carton	13½	* 13¼– 13⅝
United Wall Paper	3½	3
Same Preferred	25⅝	25
U.S. Gypsum	112½	112½
Same Preferred	*175 –180	*173 –174
West Virginia P. & P. Co.	80	* 73½– 75
Same Preferred	*108¼–110	*108½–109½

New York Stock Exchange—Bonds

Celotex 3½%	.....	90¼
Champion P. & F. Co. 3%s	.....	.....
Mead Corp. 3%s	.....	.....

New York Curb Exchange—Stocks

Am. Writing	9⅜	9⅜
Brown Co.	10⅛	8⅝
Brown Co. $5 Preferred	100	98⅝
Same Preferred $3	49½	.....
Great Northern Paper	51½	51
Puget Sound	29½	28

*Closing Bid and Asked Prices

The section of a Horton pulp digester shown on a truck in the illustration below is headed for service at a Southern pulp and paper mill. Made of 20 per cent Inconel clad steel, it was built to stand up under the constant strain of work, heat and pressure. This 9 ft. 9 in. diam. by 41 ft. 11¾ in. digester was shipped in two sections. The sections were welded together and the closing joint stress-relieved in the field.

Exacting quality controls, years of experience, and up-to-date facilities guarantee the high quality of Horton steel plate work for the pulp and paper industry. Our facilities for designing, fabricating and erecting steel plate structures are complete. We build tanks from non-corrosive metals, or we can furnish clad or corrosion-resistant lining whenever mill conditions require it.

We have equipment for stress-relieving and x-raying. Recently we enlarged our facilities for pickling and painting fabricated steel plate work. This process is an excellent method of increasing the life of Horton structures. Our four large plants — at Birmingham, Chicago, Salt Lake City, and Greenville, Pa. — are strategically located for efficient service to the pulp and paper industry.

For replacement or new construction—whenever your plant requires new tanks or steel plate work to keep pace with the ever growing demand for paper products, investigate the experience and facilities of Chicago Bridge & Iron Company. Write our nearest office for further information or quotations. There will be no obligation on your part.

The two views on this page show half of a 9 ft. 9 in. diam. by 41 ft. 11¾ in. Horton digester (above) during fabrication and (left) leaving our Birmingham plant. It is one of four recently built for a Southern pulp and paper company.

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New York, 6.....3350—165 Broadway Building
Philadelphia, 3.....1653—1700 Walnut Street Building
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Seattle, 1.....1327 Henry Building
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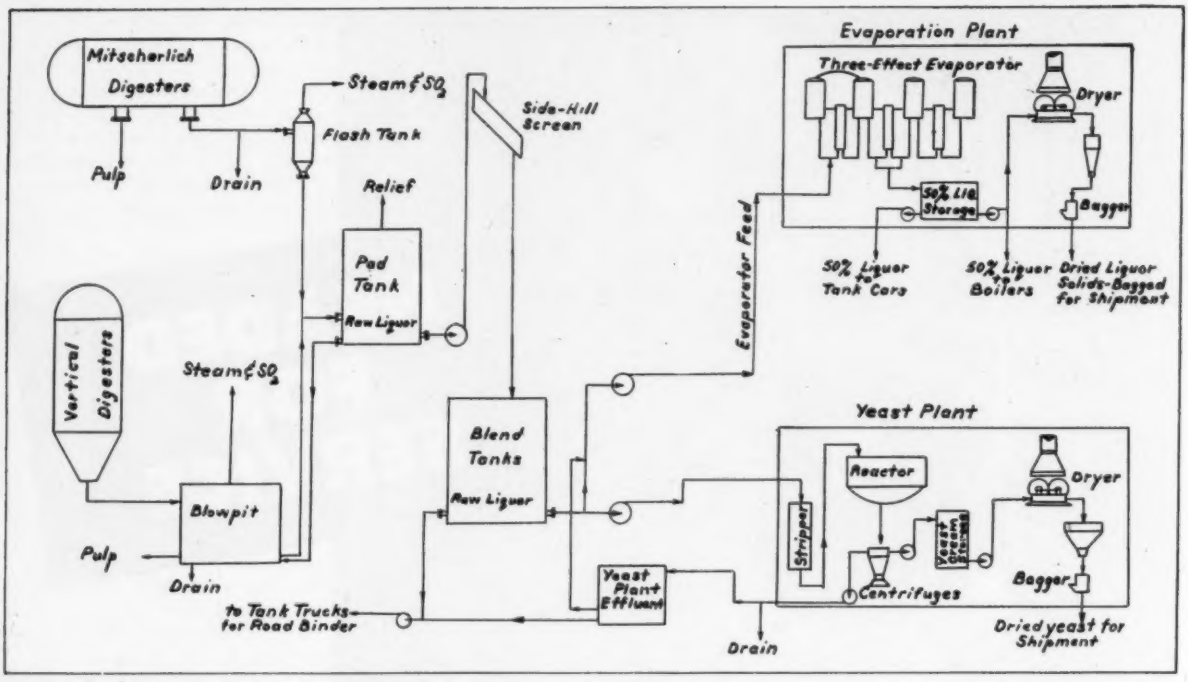


WASTE SULFITE LIQUOR utilization at Rhinelander Paper Co.

For reduction of stream pollution . . .

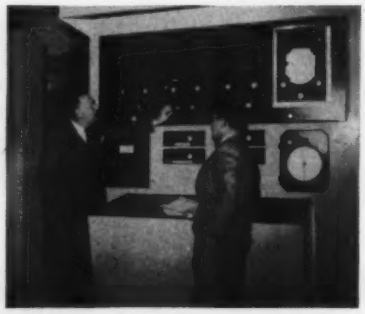
Rhinelander Paper Puts $400,000 Evaporating Plant into Operation

THE REDUCTION of sulfite stream pollution coupled with the production of useful by-products approached reality in mid-October as Rhinelander Paper Co. put its new evaporating plant into operation. The installation is designed to concentrate to 50 per cent solids the bulk of the collected liquor of the Wisconsin firm's sulfite pulp mill.

Utilizing Rosenblad reversible flow triple-effect evaporators, the installation is the first commercial one of its kind in North America. The prototypes were developed during World War II by Swedish engineers to avoid the calcium scale that forms on hot surfaces in conventional equipment when evaporating sulfite liquor. Rosenblad evaporators permit the operator to switch the steam and liquor from one side to the other of the heat exchanger surface, so that steam may soften and scour off any lime deposits before they have had time to harden on the surface as scale.

The plant in Rhinelander was designed to handle the liquor either as it comes from the blowpits or after desugaring in the adjoining torula yeast plant. The elevator plant, like the yeast plant, belongs to and is operated by Lake States Yeast Corp., a wholly owned subsidiary.

Emphasizing the experimental aspects of the operation, mill executives and technical men declared at a press preview that they are reaching for a higher standard of stream clean-up and by-products reclamation than any known to them in the paper industry. "We do not absolutely know that it will do what we expect of it," said Folke Becker, president of both firms, as he officially put the plant into operation. "Obviously we hope that it will meet our expectations. Otherwise we would not have made so large an investment in it."



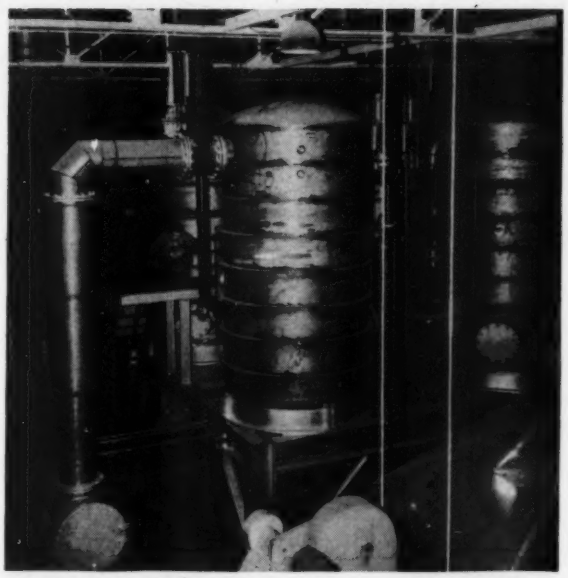
OFFICIALLY OPENING the evaporator operation, Folke Becker throws the switch that shuts off the stream of waste liquor that had been flowing into the river; Benton R. Cancell, vice president, is at the right

Million-dollar investment

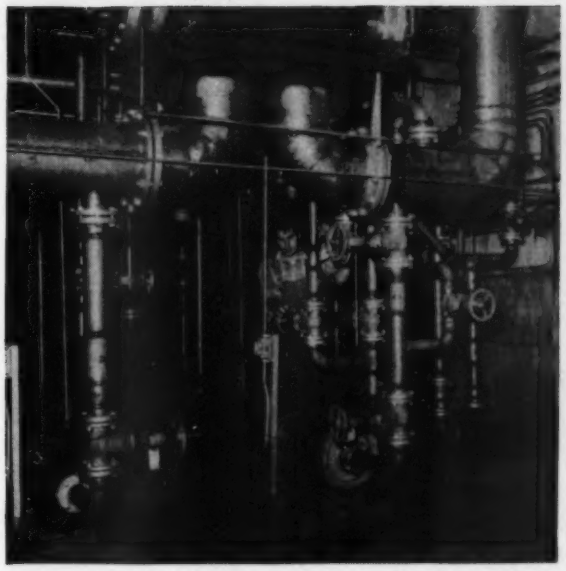
More than $400,000 has been invested in the evaporator plant. The yeast plant with which it is teamed cost more than $500,000. Lake States Yeast thus has close to $1,000,000 worth of plant for its combined objective of stream improvement and by-products production.

At the instant that Mr. Becker turned high-pressure steam into the series of stainless steel units that fill a sizeable building, the stream of sulfite liquor that previously went into the Wisconsin River began to flow through the big evaporators. The new plant removes water from this solution, leaving behind, in syrup form, an estimated 100,000 pounds of solids that previously went to waste, but from now on will be put to useful work.

"This is a long step toward completion of the mill's stream pollution program," Mr. Becker declared; "but it still must be classed as experimental because



TOWERING EVAPORATORS of stainless steel that Rhinelander Paper Co. recently put into operation



MAZE OF PIPING in basement beneath the new evaporators; stainless steel is used to withstand chemicals

we do not absolutely know what it will do . . . When we take the solids out of sulfite liquor to keep them out of the river, we create a double problem for ourselves. We end up each day with a lot of material that must be disposed of. Also, we need to get back some of the expense of operating the treatment plant in order to stay in business. That means we must sell the product or use it ourselves."

Collection system

The pulp mill's collection system is operated to collect spent sulfite liquor with solids concentration averaging 8½ per cent. Collection to this standard intercepts 65 to 70 per cent of the total solids dissolved in pulping. More dilute spent liquor is too costly to process and is of necessity released to the stream.

Rhinelander Paper has in recent years modified its sulfite pulp production policies and therefore its operating procedures. Five years ago this sulfite mill manufactured 115 tons of pulp daily, which was close to the total sulfite requirements of the papermaking operations. Meanwhile, the company has concentrated increasingly on making papers requiring greater proportions of sulfite pulp of exceptionally high quality. The production of such pulp has required, among other changes, substantially longer chip cooking. The output of the sulfite mill has accordingly worked downward to 90 tons per day of extra high quality pulp. The paper mill's requirements of standard quality pulp are obtained from other sources.

The decrease in sulfite pulp tonnage produced at Rhinelander has had a major effect on the operations of the by-products division. The torula yeast plant as it was completed in 1948 was designed to process the collectible liquor from 60 tons of sulfite pulp operation, which was about one-half of the total spent sulfite liquor then being produced. In the interval, operating experience plus equipment modifications have increased the processing capacity of the yeast plant by approximately 50 per cent. Thus there has been achieved a working balance between the supply of sulfite liquor and the yeast plant's processing capacity.

Mathematically, the pulp manufacturing and by-products operations of the parent company and subsidiary now are designed to work out as follows (all figures are approximations on dry basis weight):

Operation	Total Tons
Pulpwood to sulfite mill	180
Sulfite pulp manufactured	90
Solids in sulfite liquor	90
Solids to yeast plant in liquor (65-70% collected)	62
Solids to stream in dilute effluent	28
Sugar removed from liquor in yeast plant (19% of total solids)	12
Solids in yeast plant effluent available for evaporators	50

Yeast process

To understand how the evaporators fit into the over-all program of reducing sulfite pollution and recovering by-products, the new process must be viewed in relation to the yeast process that immediately precedes it.

Spent sulfite liquor is pumped from the pulp mill for a distance of about 600 feet through stainless steel pipe to wooden storage tanks at the yeast plant. Here it is pumped to liquor conditioning equipment. After cooling it is pumped continuously to the yeast-growing tank, where it is aerated, agitated, and receives inorganic nutrients. Finished wort continuously bleeds off to centrifugal separators. After washing and recentrifuging, the yeast cream goes to a drum dryer.

Evaporating plant

The clarified de-sugared liquor is pumped 600 feet through a surge tank to the evaporating plant. This plant consists essentially of three General American Transportation Corp. natural circulation heaters of 1,550 square feet each; four GATX vapor bodies; the necessary transfer and condensate points, and intermediate piping. It is designed to operate between 25 pounds psig and 26 inches of vacuum, and is

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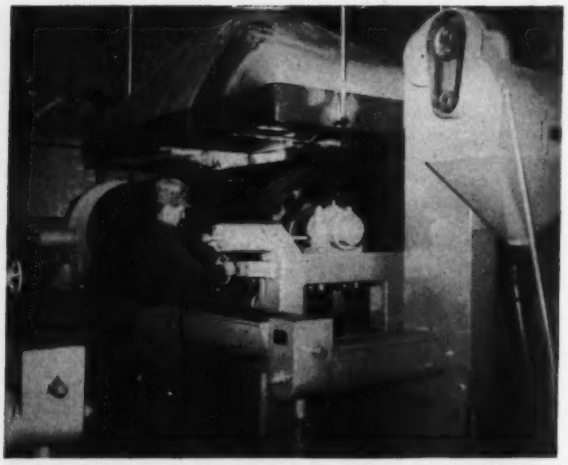


TWO TWIN-DRUM dryers like this one produce 94%-solids dried lignin from de-sugared sulfite liquor

POWDERED LIGNIN is bagged for shipment after passing through the evaporators and dryers

equipped with multiple jet thermo-recompressors to utilize the energy in the 125 psig feed stream without superheating. All equipment including valves and piping is 316 stainless steel. Heaters are 316 extra low carbon stainless. All equipment is operated from a control panel board, excepting a few periodic operations that require manual control, such as switching the liquor flow from one side to the other. (All instruments are by Taylor Instrument Companies, Minneapolis-Honeywell Regulator Co., and Sparling Meter Co.)

The evaporators are designed to evaporate nominally 33,000 pounds of water per hour, attaining 3.18 pounds of water evaporated per 1 pound of steam. Since the de-sugared liquor is at about 7 per cent concentration when it reaches the evaporator, it is necessary to take out by evaporation slightly more than 6 pounds of water from this relatively dilute material to produce 1 pound of 50 per cent concentrate, which is the objective of the process. Thus it requires about 2 pounds of steam to produce 1 pound of 50 per cent concentrate. The concentrate is stored in two 10,000-gallon tile tanks. (Tanks and chests employed in the installation are manufactured by Chemical Linings Inc. and Hauser-Stander Tank Co.)

Heat in the condensate from the heaters (approximately 250F.) is utilized first in an American Heat Reclaiming Corp. spiral inter-heater between low temperature and high temperature effects, and finally in a spiral feed preheater before discharging to waste. Vapors from the last effect are condensed in a shell and tube condenser that produces hot water for use in the pulp mill.

Three utilization methods

From the tile storage tanks previously mentioned the 50 per cent concentrate may be pumped in any of three directions: (1) to dryers for production of 94 per cent dry solids; (2) to a dock for loading tank cars or tank trucks, or (3) to the boiler house for utilization as fuel.

Drying equipment consists of two 220-square-foot twin drum units by the Buflovak Equipment Division of Blaw-Knox Co. These are equipped with Reeves Pulley Co. variable speed transmissions and designed to operate at steam pressures up to 100 pounds psig. Dried solids fall off the drums into a Chain Belt Co. screw conveyor and are then elevated to impact mills. Now in powder form, the solids again are elevated to a small storage bin, from which they flow by gravity to a screw-type bag filling machine by St. Regis Sales Corp.

Principal uses

The de-sugared solids, whether in the dry or 50 per cent concentrate form, consist essentially of lignin compounds. The material is to be marketed by Lake States Yeast under the trade name "Toralig." Principal uses are as adhesives, dispersants, and chemical raw materials.

Adhesive uses include not only actual cements and glues, but also binders. Linoleum cement, remoistenable adhesive, and paper sizing offer substantial outlets of this general type. Major opportunities as binder loom for foundry cores, fuel briquettes, and ore briquettes.

Lignin as a dispersant already has found sizeable markets for conditioning well-drilling mud, in manufacture of portland cement, in formulating concrete mixes, and in boiler compounds.

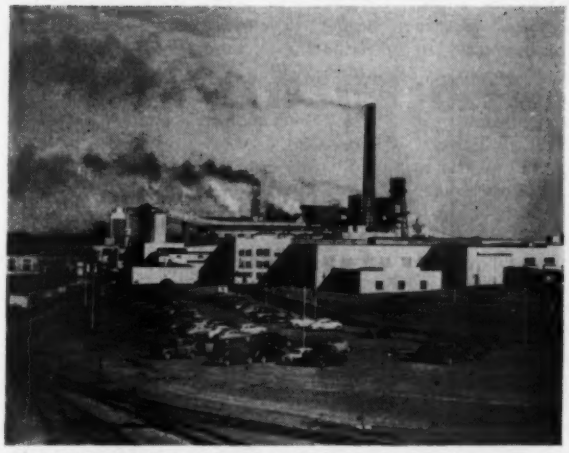
As a chemical raw material, lignin from other sources already is in wide use. Particularly publicized is its use as the basic material for vanillin. Lake States Yeast plans to explore other chemical outlets for this versatile material, with particular emphasis on any advantages inherent in the de-sugared form. The firm already has contracted to sell 20 per cent of the expected output to a chemical manufacturer as raw material from which to derive a food product and pharmaceutical intermediate.

Whatever fraction remains unsold at any time will be piped in 50 per cent concentration to Rhinelander Paper's boiler room for burning as industrial fuel. That is, however, merely a last-resort use to prevent having to flow sulfite liquor into the river. The firm's combustion engineers have made burning tests and have proved that the material burns satisfactorily when atomized over a coal bed. This method is feasible here, since the mill requires far greater quantities of steam than can be produced from the sulfite liquor available.

Although the evaporator plant was built by Lake States Yeast, the scientific and engineering knowledge of the Sulphite Pulp Manufacturers' Research League of Appleton was freely employed throughout. Rhinelander and a dozen other Wisconsin mills, along with one Michigan mill, jointly support this organization to do cooperative research.

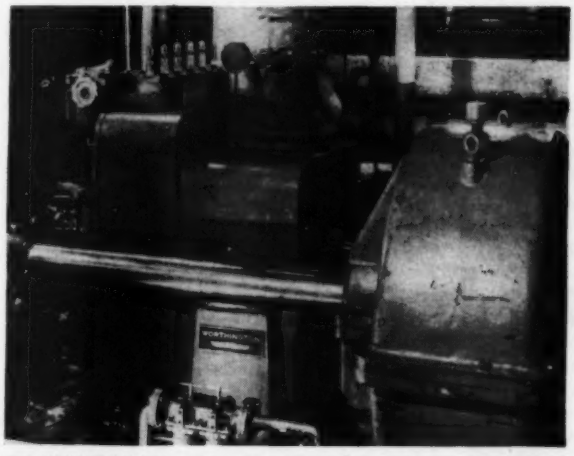
Additional equipment

Equipment sources in addition to those already listed are as follows: *Pumps*—Worthington Corp., Blackmer Pump Co., and Goulds Pumps Inc.; *piping*—Felker Bros. Mfg. Co., Wisconsin River Supply Co., and General American Transportation Corp.; *valves*—Hasco Valve & Machine Co., J. B. Astell Co., Worthington, Wisconsin River Supply, and Fisher Governor Co.; *structural steel*—Wisconsin Bridge & Iron Co.; *electrical equipment*—Westinghouse Electric Corp. and Cutler-Hammer Mfg. Co.; *atomizing spray burners*—Babcock-Wilcox Co.; and *fans*—Aerovent Fan Co.

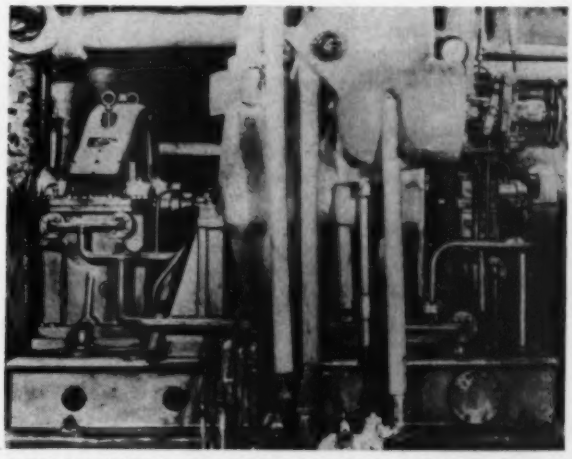


NORTHWEST PAPER Co.'s plant at Cloquet, Minn., has increased production and improved the paper quality with new steam turbines to drive two paper machines

PUSH-BUTTON CONTROLS near this 212-inch paper machine permit the operator to quickly control speed; the turbine is rated at 700 hp



700 HORSEPOWER turbine has raised the production of the 212-inch paper machine to 930 fpm and will eventually achieve 1200 fpm following contemplated change in back line gears



PAPER MACHINE with a 96-inch wire width at Northwest Paper is driven by this 300 hp Worthington turbine; the machine is driven at 550 rpm through line shaft and belting

Northwest Paper Boosts Output, Quality with New Turbines

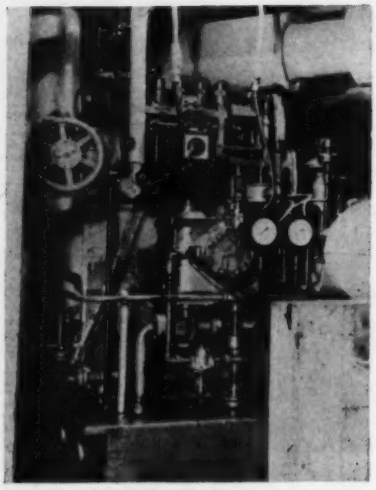
INSTALLATION OF TWO steam turbines to drive paper machines at the Northwest Paper Co. mill at Cloquet, Minn., has increased production by from 12 to 13 per cent, while effecting improvements in paper quality. Another benefit has been reduction in such operating costs as superintendence and maintenance of power equipment.

To achieve a daily production of 275 tons of finished paper, it was necessary to expand the output of the paper machines. Analysis of the problem by E. C. Gamble, manager of the mechanical service department, showed that Nos. 1 and 2 machines were limited by drying capacity. Nos. 3 and 4 had reserve drying capacity and were limited by speed. It was concluded that an immediate production increase could best be achieved by raising the speed of Nos. 3 and 4.

No. 3 machine, with fourdrinier 96 inches in width, was driven through a line shaft by a reciprocating steam engine at a maximum speed of 530 fpm. The limiting factor was the rim speed on the line shaft pulley. If the pulley were changed, the engine could not control speed closely. The solution was the installation in July 1951 of a 300 hp type S-2 Worthington Corp. steam turbine. This unit is rated at 5050 rpm and drives the line shaft through Worthington reduction gears that reduce the output speed to 550 rpm. With the new turbine it was possible to operate the paper machine at 600 fpm, a gain of 13 per cent. The turbine, it is reported, can support much higher speeds, and alterations are being made in the paper machine to permit quality output at 1,000 fpm. This will mean a gain of 88 per cent over the original speed.

No. 4 Machine Up 12 Per Cent

The No. 4 machine, with 212-inch fourdrinier width and 197-inch trim size, was driven by a 415 hp turbine. With this turbine at maximum power and maximum allowable speed, paper machine speed was 830 fpm. Installed in July 1951 was a 700 hp type S-4 Worthington steam turbine that turns at 4570 rpm and drives the lineshaft through Worthington reduction gears at 550 rpm. The new turbine immediately raised machine speed to 930 fpm, a 12 per cent rise. Actually, the turbine is designed to permit 1,200-foot production, but speed is limited now by the capacity of the back line belts. Contemplated change in back line gears will allow the maximum machine speed without exceeding proper belt speed. The



MULTI-VALVE SYSTEM on the 700 hp turbine that automatically regulates inlet steam

expected 1,200 feet will be a 44 per cent increase over the original speed.

With the reciprocating engine, it was necessary to have a man stationed near the mechanism to handle speed changes on signal from the floor above. With the new equipment, turbine speed is controlled from a push-button control near the paper machine, permitting the operator to adjust paper weight by instant, smooth speed changes to compensate for temperature and other factors. The new turbines permit a wider range of speed variations.

Governors used in the operation are of the PG type manufactured by Woodward Governor Co. According to Mr. Gamble, governing "has been excellent," and the new units have entirely eliminated the off-weight paper caused by speed variation. The firm keeps a spare governor on hand and can switch governors in 30 minutes.

Installation

The new turbines were installed between 6 a.m. Sunday and noon on Monday, with a loss of only four production hours. Currently, the plant operates 24 hours a day, seven days a week, and savings in maintenance time have been far greater than the time lost on installation. On the new turbines, Mr. Gamble plans only a yearly inspection.

The Worthington multi-stage turbines were integrated with the existing steam system, which includes four water-tube boilers with continuous rating of 300,000 lbs. steam per hour, and two Westinghouse turbine-generators, one rated at 1500 kw and the other at 2500 kw. The firm's total electric requirements are about 10,000 kw, part of which is supplied by a hydro plant with 5000 kw maximum capacity and 2000 kw firm capacity. Part of the load is handled through purchases from a private utility, and the rest is produced by the steam turbines. The turbine-generators are used only as much as is necessary to provide process steam for the mill.

Average inlet steam pressure for the Worthington geared-drive turbines is 190 psig at 100F. superheat. Exhaust pressure is varied from atmospheric to 50 lb. in accordance with drying requirements.

Since all steam is used for processing, Mr. Gamble is planning a multi-pressure system for the entire plant, with a dispatcher to send steam to various machines in accordance with drying requirements. It will be possible to set up pressure and temperature to suit the specific paper on the machine and thus promote quality.

Principal equipment serving the new Worthington turbines is as follows: oil cooler, Kewanee-Ross Corp.; gauges, Crosby; tachometer, Brown Instrument Co.; pressure recorder, Bristol Co., and steam flow recorder, Bailey Meter Co.

Ketchikan to Use Magnesium Oxide Recovery System

Ketchikan Pulp Co. at Ward's Cove, Alaska, will be the first new mill to use the magnesium oxide recovery system, Harold D. Cavin, chief engineer for the firm, has revealed.

Mr. Cavin declared that this process was developed at the Weyerhaeuser Timber Co. pulp plant at Longview, Wash., in 1948. In the process the waste liquor is burned and used as fuel in generating steam.

Excavation work for the plant foundations and construction of the concrete and steel pier near the mill site are to be completed soon, according to Mr. Cavin. The mill is scheduled to begin production early in 1954.

Marathon Establishes New Packing Department

Marathon Corp., Menasha, Wis., has established a general packaging department to expand its operations beyond the food packaging fields in which it is now active. Richard B. Simpson, previously a Chicago area sales representative for the firm, has been named sales manager of the new department.

"There will be expansion in the packaging of food products that do not fall within the lines currently served by Marathon's frozen foods, bakery, dairy, and meat and vegetable oil packaging departments," Mr. Simpson declared recently, "as well as in other products such as pharmaceuticals, chemicals, photographic film, and many other items that need special protective packaging."

Marathon's product development department will devote special attention to the new department, studying the adaptability of the firm's regular line of products to general packaging requirements, developing new products and packaging methods, and also working closely with the various machine companies that may be involved in packaging applications in which Marathon is interested.

International Paper Opens $400,000 Pulp and Paper Laboratory at Mobile

A $400,000 laboratory for basic research work in the development of new pulp and paper grades manufactured from southern forests was dedicated in Mobile, Ala., recently by officials of the Southern Kraft Division of International Paper Co.

At the ceremony Erling Riis, vice president and general manager, called the building "probably the most modern and completely equipped pulp laboratory in the South." Scientists will be able to duplicate all mill processes on a small scale, greatly facilitating the firm's program of research on highly-specialized pulp grades.

Three pulp pilot plants and laboratories for chemical analysis, chemical research, and physical research are included in the new structure, as well as three controlled humidity rooms and facilities for photographic research and standard pulp and paper testing.

According to Mr. Riis, the research department at Mobile will concentrate on basic pulp research problems of company-wide scope, or special work that mill laboratories are not equipped to perform. He pointed out that each of the mills in the Southern Kraft Division will continue to have its own quality control laboratory and staff and will be encouraged to work out its own technical problems, freeing the Mobile organiation for broader and more fundamental studies.

The Division has been active in research work for many years. Among the achievements of this organization were the first mass production of fourdrinier kraft linerboard from southern pines, the first successful bleaching process for both kraft paper and board in the South, the development of a process for using southern hardwoods to produce the company's Chemifibre corrugating medium and development of the first process for making dissolving pulp by the kraft process from southern hardwoods.

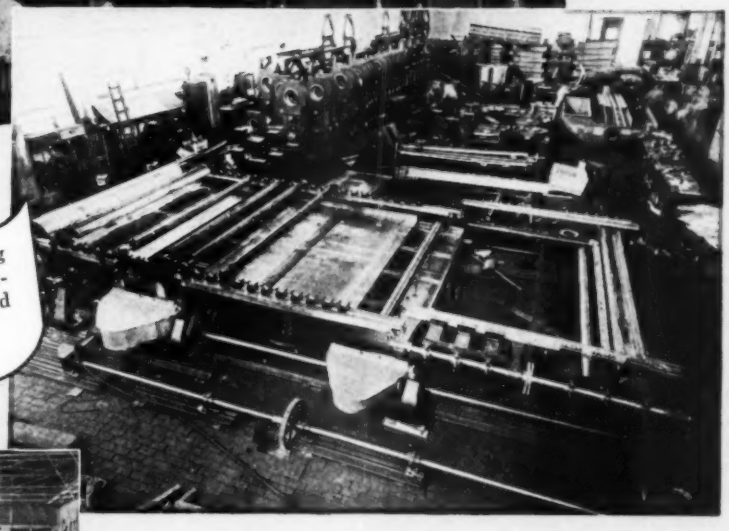
Pulp preparation pilot area

The pulp preparation pilot area is equipped for making unbleached pulp by any process. A type 316 stainless steel stationary digester with a capacity of about 4 cubic feet is located in the area. The digester is equipped for direct or indirect cooking and is provided with

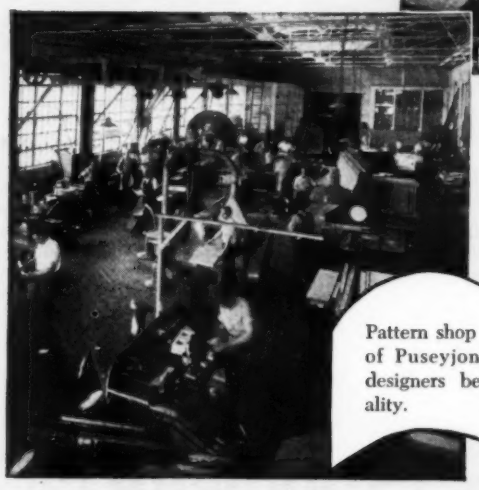
Puseyjones at Work . . .

Cutting winding wire grooves in Stream-Flow Cylinder Mould.

THE SIGN OF TRADE MARK SUPERIOR QUALITY



Erecting shop showing partially erected Fourdrinier Part for high-speed Puseyjones Machine.



Pattern shop where plans of Puseyjones machine designers become a reality.

Puseyjones experience and facilities are freely offered to any manufacturer who wants to increase production and improve quality. Whether you are interested in modernizing your present equipment or installing a complete new machine – Fourdrinier, Cylinder, Yankee, or a combination of any of these types – call or write us today.

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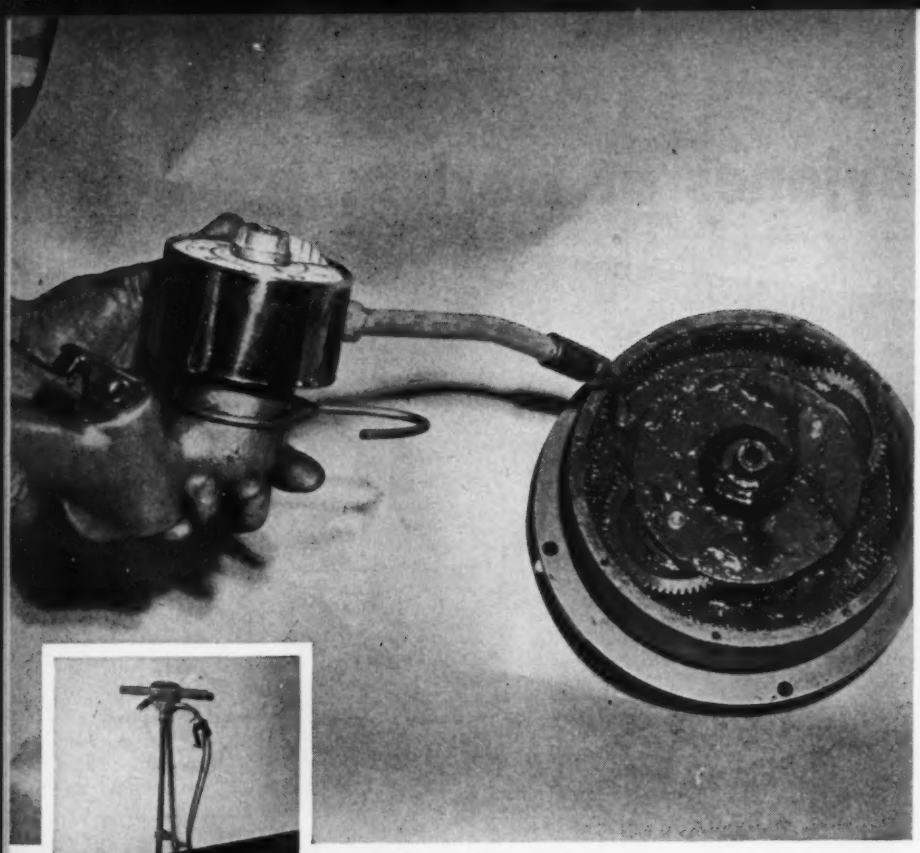

Solves leakage problem . . .

● Multi-clean Products, Inc., St. Paul, Minnesota, manufactures industrial floor polishing and scrubbing machines. The machines are shipped with grease already installed in gear reduction units. The problem faced by this company was one of finding a grease that would stand up under hard service and not leak from the gear units. Greases tried either caused or threatened leakage troubles.

Called in on this problem, a Standard Oil lubrication specialist recommended STANOBAR Grease "S", a highly stable grease with a unique adhesive characteristic. Given an accelerated service test, STANOBAR did not leak from the gear unit, and its consistency showed no change that would later cause a leakage problem. There was no wear of gears or bearings. Adopted for use in the units, STANOBAR has solved this company's lubrication problem on every count. Officials have been able to eliminate the costly and troublesome practice of having all units returned to the factory, at 12 months intervals, to be repacked with grease.

STANOBAR
TRADE MARK
Grease

The same lubricating qualities of STANOBAR that solved this problem for Multi-clean Products, Inc. can serve you in a wide variety of applications. A Standard Oil lubrication specialist will be glad to discuss those applications with you. He's right there in your section of the Midwest. You need only phone your local Standard Oil office. Or write, Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

What's YOUR problem?

C. L. Daub is the Standard Oil lubrication specialist who helped Multi-clean Products, Inc. solve an important lubrication problem through his recommendation of STANOBAR Grease.

Like all Standard Oil lubrication specialists, he has a broad background of practical experience plus thorough training in Standard's own schools. And like all lubrication specialists, his on-the-job assistance is always available to the industries in the immediate area he serves. He is one of a corps of experienced men who make their headquarters wherever industry is located throughout the Midwest. Call for the services of your Standard Oil lubrication specialist today. When he stops at your plant, be sure to get information on these outstanding products:

STANOIL Industrial Oils— This multi-purpose line of oils provides cleaner operation of hydraulic units, supplies effective lubrication in compressors, gear cases, and circulating systems. One of two grades can replace a wide variety of special oils and lubricants.

CALUMET Viscous Lubricants— On open gears and wire rope, these greases resist washing and throw-off. Their superior wetting ability affords better coating of gears and better internal lubrication of wire rope.

STANORUST Rust Preventives— The eight grades of STANORUST form one of the most complete and effective lines of rust preventives on the market today. Each has been scientifically and specially developed for its intended use. The grades range from a fingerprint remover to a heavy semi-solid that protects against corrosion for years under the most severe outdoor exposure.

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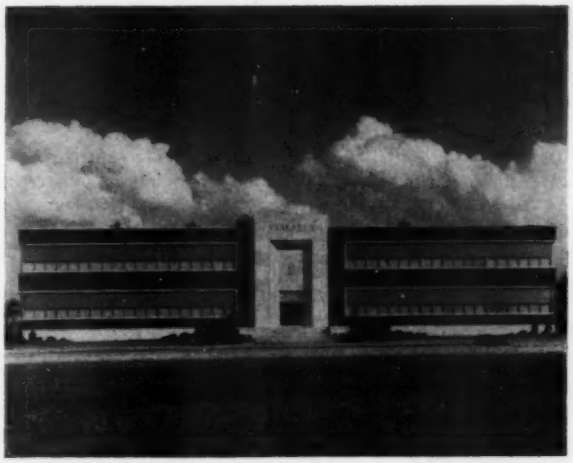


$400,000 RESEARCH LABORATORY of International Paper at Mobile Ala.

CHEMICAL RESEARCH is conducted in these modern surroundings at the laboratory

PAPER RESEARCH and development and pulp bleaching area at Mobile

PAPER TESTING LABORATORY at the new International research center

liquor measuring tanks, turpentine condenser, and recording pressure and temperature instruments.

There is a cyclone and a diffuser following the digester and a 30-inch centrifugal is used for thickening after the diffuser. A stainless steel rotary autoclave of 1 cubic foot capacity is also used for cooking or for other process studies requiring elevated temperatures and pressures. A laboratory Bauer refiner and an Abbe ball mill are provided for use in the preparation of semichemical pulps and also for studying the refining characteristics of other pulps. Equipment is available for miscellaneous chemical testing, chip classification, and moisture testing.

Pulp purification pilot area

The pulp purification pilot area is located adjacent to the pulp preparation area. Equipment includes a Valley laboratory flat screen, constant temperature water baths, a 12-inch centrifugal, and earthenware and stainless steel containers for bleaching. Facilities are available for the necessary analytical work and also for the preparation of reagents used in bleaching, such as chlorine water, hypochlorite, chlorine dioxide, and peroxide solutions.

Paper development pilot area

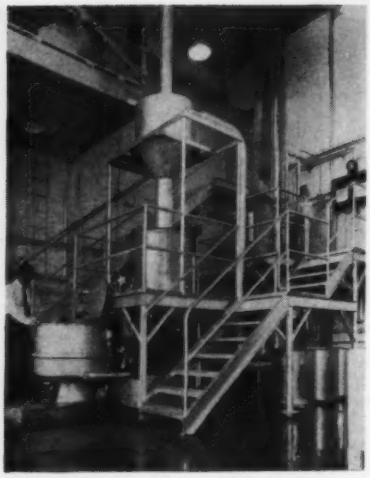
The paper development area is equipped for processing pulp for physical testing and contains a complete set of equipment according to TAPPI T-200 and T-205. This equipment includes a 1½-pound Valley laboratory beater, British sheet machine, a standard disintegrator, press, drying rings, and a Canadian standard freeness tester. Several larger sheet molds are provided for use where larger sheet sizes are required. A two-roll press is provided for studying surface applications, and a Noble & Wood rotary drum sheet dryer is used for drying sheets at any desired temperature. This area is also equipped for moisture testing and miscellaneous chemical testing.

Paper testing laboratories

Three laboratories are provided for the physical testing of paper; all three have controlled temperature and humidity. Normally one of the laboratories is maintained at TAPPI standard conditions of 73F. and 50 per cent relative humidity, one is maintained at 73F. and 20 per cent relative humidity, and the third is maintained at 73F. and 75 per cent relative humidity. The normal physical testing of paper is carried on in the room maintained at 73F. and 50 per cent. The wet and dry rooms are used for special investigations where it is desirable to study the behavior of paper under various atmospheric conditions.

Most of the standard paper testing instruments required for testing any kind of paper or board are available in these laboratories. Also available are several pieces of special equipment, such as a single flute crush tester used for studying the quality of corrugating board, an instrument for measuring expansion and contraction of paper, and an instrument

DISTILLATION EQUIPMENT in the analytical laboratory



PILOT PLANT equipment for making pulp at Mobile

for measuring coefficient of friction of paper.

Other facilities in the new Mobile structure include a dissolving pulp pilot area, a pulp evaluation laboratory, an optical laboratory, an analytical laboratory, and chemical laboratories.

The research department is headed by John W. Gilbert, director of research, and G. S. Mabrey, associate director of research. Location of the new building is adjacent to the division offices at Mobile and will permit close work coordination between the laboratories and the manufacturing and engineering staffs.

Mando Reviews Year's Progress in Expansion and Modernization

CONTINUING A LONG-RANGE modernization and expansion program started in 1945, Minnesota & Ontario Paper Co. has during 1952 completed several important projects with emphasis on diversification. According to J. B. Faegre, Mando president, the firm has spent more than $29,000,000 during the past seven years, so that today production includes eight different kinds of pulp, from which a variety of papers are manufactured.

Highlights of 1952 plant improvements at Mando's three mills—at Fort Frances and Kenora, Ont., and at International Falls, Minn.—are as follows:

International Falls

The rebuilding of No. 2 Insulite machine at International Falls during this past year increased the daily output of the firm's four Insulite machines by 25,000 square feet. They now produce 1,275,000 square feet a day. The project marked the first extensive remodeling and building job on No. 2 since it was installed in 1928.

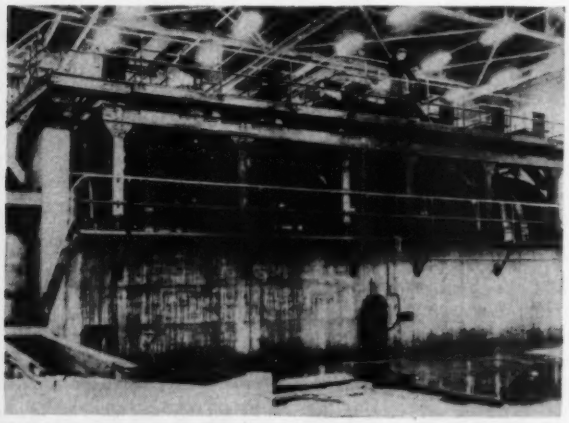
Increased output and greater efficiency of No. 2 were accomplished by completely rebuilding the 360-foot drying kiln, addition of a 30-inch suction roll, replacement of the headbox, and other major changes. The air circulation system, designed to remove water from the Insulite sheet, was transformed into a three-zone system, replacing the existing two-zone system. More rolls were added to the kiln. Approximately one mile of heating pipes was added to the drying unit, and about a third of the present coils were replaced. A new 30-inch suction roll replaces a solid press roll. Three new calipers for recording the thickness of the board as it comes off the forming cylinder were installed.

Installation was under the direction of the plant engineer force with assistance from Downingtown Mfg. Co., Downingtown, Pa., and Coe Mfg. Co. of Painesville, Ohio.

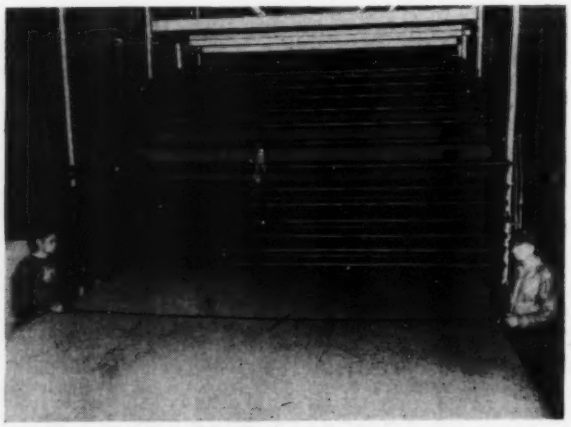
Mando engineers plan to shut down No. 2 paper machine for a partial modernization. A new electrical drive and a second suction press are scheduled to be installed. The new drive is supplied by Reliance Electric & Engineering Co.

In January of this year work was completed on the installation of two 12- by 45-foot barking drums. They were equipped with 200 hp driving motors, with a hydraulic coupling between motor and drive. The barkers are of the water vat type and were furnished by Fibre Making Processes Inc., with the foundations laid by Paul A. Laurence Co. of Minneapolis.

The purchase of a fourth Diesel-electric locomotive this year marks the end of the steam engine era as far as Mando's International Falls mill railroad—the Minnesota, Dakota & Western—is concerned. The conversion to Diesel from steam power began in 1948. The four Diesels replaced a like number of coal-burning locomotives that have



LARGE BARKING DRUMS at Mando are driven by electric motors, one of which can be seen at the upper right



INSULITE SHEET is pulled from the modernized No. 2 machine by workers at the International Falls mill

An Overwhelming Preference

for DIAMOND Automatic Cleaning OF CHEMICAL RECOVERY BOILERS

Diamond Automatic Soot Blowers have been sold for the cleaning of chemical recovery boilers in the following plants. This list covers all but three or four of the black liquor jobs placed in the United States and Canada in recent years. The reason for this overwhelming preference? You obtain correct recovery boiler cleaning and high boiler availability at minimum cost by using Diamond Automatic Soot Blowers.

Bloedel, Steward & Welch, Ltd.
Brompton Pulp & Paper Co.
Brown Company
Brown Paper Mill Company
Brunswick Pulp & Paper Co.
Calcasieu Paper Company
Camp Manufacturing Company
Canada Paper Company
Cellulosa Koncern (Sweden)
Champion Paper & Fibre Co. *(2 Plants)*
Chesapeake Corporation
Companhia Portuguesa de Celulose (Portugal)
Consolidated Paper Company
Container Corporation of America
Continental Can Company
Crossett Paper Mills Ltd.
Crown Williamette Paper Co.
Dryden Paper Company
Enso-Gutzeit Oy (Finland) *(2 Plants)*
Fibre Board Products Corp.
Frazer Company, Ltd.
Gaylord Container Corp.
Gulf States Paper Company
Halifax Paper Company
Hollingsworth & Whitney Co.
Hudson Pulp & Paper Co.
International Paper Corp. Southern Kraft Division *(7 Plants)*
Joutseno Pulp (Finland)
Ketchikan Pulp & Paper Co.
Kalamazoo Vegetable Parchment Co.
A/B Kemi, O/Y (Finland)
Longlac Pulp & Paper Co.
Longview Fibre Co.
H. R. MacMillan Export Corp. Nanaimo Sulphate Pulp Div.
Macon Kraft Company
Marathon Paper Company
Mead Corporation *(2 Plants)*
Mo and Donsjo A. B. Husums (Sweden)
National Container Corp. *(3 Plants)*
National Paper Corp.
North Carolina Pulp Co.
A/B Oulu, O/Y (Finland)
Oxford Paper Company
Pacific Mills Limited
Rauma-Raahe Oy (Finland)
Riegel Carolina Corp.
St. Helen's Pulp & Paper Co.
St. Joe Paper Company
St. John's Sulphite, Ltd.
St. Mary's Kraft Corp.
St. Regis Kraft Corp.
St. Regis Paper Co. *(2 Plants)*
Howard Smith Paper Mills, Ltd.
Sorge Pulp Co., Ltd.
Southern Advance Bag & Paper Co.
Southern Paperboard Co.
Thilmany Pulp & Paper Co.
Union Bag & Paper Co.
Union Corporation, Ltd.
United Paper Company
S. D. Warren Co.
West Virginia Pulp & Paper Co. *(2 Plants)*
Weyerhauser Timber Co. *(3 Plants)*

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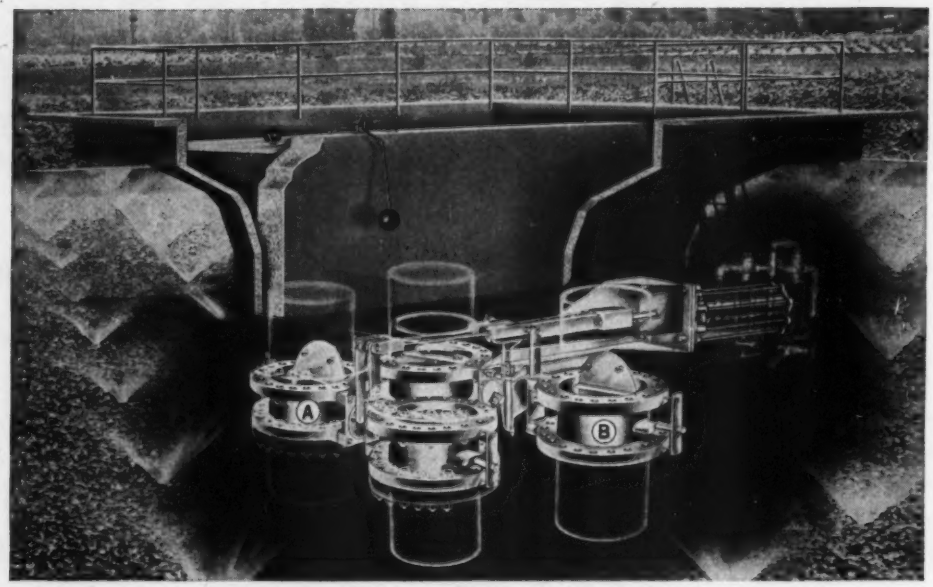
There is a DIAMOND SOOT BLOWER for Every Boiler Cleaning Requirement

R-S valvEvents

• EXCERPTS FROM THE R-S BOOK OF EXPERIENCE •



R-S Simplified Sewage Control System

This dosing pit control system is located in the Ontario-Upland, California, sewage treatment plant. In continuous operation day and night for over two and one-half years, it shows the tandem cycling of the valves which occurs every four minutes.

The system consists of four twenty-four inch heavy duty R-S Valves operated by a single water cylinder through cross linkage. While the far pit is filling through valve (A), the near pit is draining through valve (B) and discharging through the spray nozzles. As soon as the far pit is full, the float control will actuate the water cylinder by means of air operated three way valves, thus draining the pit and filling the near pit at the same time. Handwheel operation is provided for emergency use.

Rugged construction with minimum friction means long life and trouble-free operation for R-S Valves.

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been in service for more than 30 years.

Highlight of the 1952 modernization activity at Fort Frances was the erection of a new woodroom. Put into production during the spring of the year, the new woodroom completes a program of modernizing the woodrooms at each of Mando's three mills. The Fort Frances structure replaces existing facilities, a part of which has been in operation since 1914, when the mill was constructed.

Fort Frances

The new facilities are housed in a 73- by 164-foot steel and brick building. With the use of time and labor saving equipment in the new woodroom, barking for a 24-hour groundwood operation can be done in 16 hours. Under the new plan of operations, logs are hauled from the Rainy River and from the nearby wood yard by conveyors manufactured by Vulcan Iron Works, Winnipeg, Man. The river conveyor includes an extended jackladder that reaches 120 feet out into the stream, where the water runs deep and fast. The swift current brings the logs to the mouth of the jackladder. The conveyor then rises and crosses the railroad tracks between the river and the woodroom on an overhanging bridge.

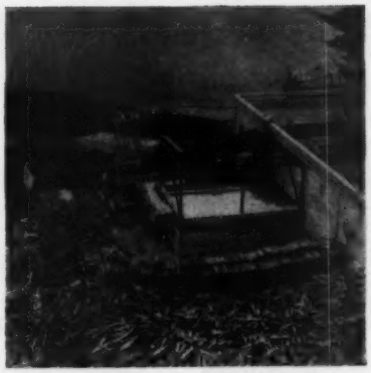
Logs from the wood yard reach the woodroom via a 420-foot conveyor. This conveyor brings logs to the woodroom that were shipped to the mill by either truck or rail.

The newly completed woodroom has four 12- by 45-foot barkers, as compared with six 9- by 30-foot units in the old facility. The barking drums are supplied by Horton Steel Works Ltd., Fort Erie, Ont. Power from the barkers is provided by individual 150 hp motors through Texrope drives. The electrical equipment is from Canadian Westinghouse, Hamilton, Ont.

Woodroom working conditions are greatly improved. Lunch, locker, and washroom facilities are now on the ground floor, beneath the slasher area, and are finished in cream-colored tile. Two hundred fluorescent units with two 40-watt tubes in each give the new room ample light. Heating and ventilating systems by Ross Engineering of Montreal are a part of the new structure.

The building was erected by Stead & Lindstrom, Port Arthur, Ont. Foundations and floors are of reinforced concrete. Roof construction consists of a poured concrete slab on steel purlins, insulated with one inch of Insulite and topped with built-up roofing.

With the earth-moving activities under way during the first week of June this year, Mando's new groundwood mill will be designed to process logs produced by the woodroom. The new magazine grinders will use 4-foot lengths, replacing the present hand-fed grinders using 2-foot lengths.



NEW BARK RECOVERY UNIT at the Kenora newsprint mill; the recovery room adjoins the woodroom

The new grinder room replaces all existing grinder facilities, a majority of which have been in operation since 1914, the year the Fort Frances mill went into production. Thirteen Watrous super hydraulic magazine type grinders are to be installed. They replace 14 old style pocket-type units. Allowance has been made for the addition of a 14th grinder.

Six new 5500 hp motors will drive 12 of the grinders, with the 13th receiving its power from a 3500 hp motor now on hand. The 85- by 275-foot structure is to be of steel frame and will be constructed by Dominion Bridge Co. An insulated metal sandwich prefabricated sheeting will form the walls. The sheeting is supplied by Robertson Irwin of Hamilton, Ont.

The magazine grinder is to be loaded from the third or charging floor. Wood conveyed to this floor will be sorted by specie for the grinders. Total grinder capacity of newsprint production is estimated at 425 tons a day. In addition to newsprint stock, 90 to 100 tons of Insulite stock may be ground daily.

Kenora

At the Kenora newsprint mill the bark recovery system was modernized. When completed, it will more efficiently remove the bark from the waste water before it goes into the river and will reduce handling costs. Started the middle of this year, the new bark recovery facilities will be housed in a 28- by 36-foot brick structure. The building is to be attached to the existing woodroom.

The system provides for the sluicing of the bark from the four 12- by 45-foot barking drums to a circular dewatering screen 5 feet in diameter and 18 feet in length. The bark from the screen is then carried to a hog via a rubber belt. From the hog, it goes to the bark presses. Water containing fine bits of bark flows from the screen to three Tyler vibrating screens. Once the bark is removed from the waste water it is pressed and later burned. The waste water is pumped to the sewer or is used as shower water on the barking drums.

Other major improvements at Kenora includes pre-heaters for No. 3 and No. 4 boilers, installation of steel trusses on transfer and cross conveyors, replaced barking drum, agitators in the groundwood decker chest tile-lined and replaced, replaced Bird screens on No. 8 paper machine, replaced dryer motors on No. 9 machine, replaced master shaft on No. 9 machine Harland drive, new heat recovery system on No. 9, and a new heating and ventilating system for the sulphite and screening rooms.

Efficient salvage system set up at International Falls

For the first time, Mando's International Falls salvage operations for discarded machinery is under one roof, with a specific crew assigned to salvage and recondition production equipment—discarding for scrap worn material and sending useable and reconditioned parts back to the stores department.

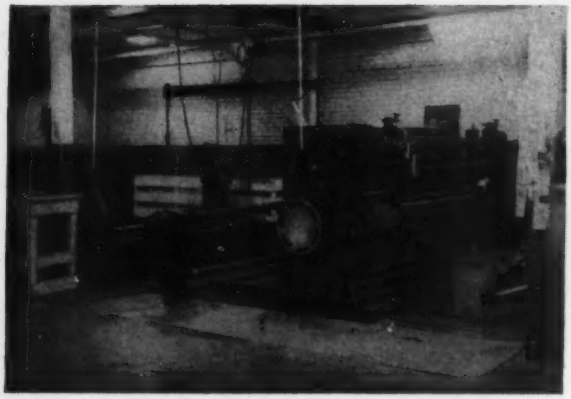
Before the erection of the 80- by 60- by 20-foot steel structure, salvage was haphazard. Much of the work was done in various open areas in the mill yard. Lack of storage space resulted in extensive rust damage to material left outdoors. Furthermore, much valuable paper and lap storage space was lost inside the mill to the storage of reclaimed rolls, belts, bearings, and other equipment that could not be stored outside. And poor housekeeping in mill buildings resulted from the crowded conditions.

According to Clarence Larson, vice president in charge of production, the new salvage building is the brain child of the engineering department. Erected by Paul A. Laurence Co. of Minneapolis, the building has galvanized metal siding and roof and a reinforced concrete floor with open grated drainage through the center of the structure. Space is provided for a service bench and a desk where a perpetual inventory is kept. Incorporated in the construction were shelves and racks, where miscellaneous equipment, spare parts, repair parts, etc., can be catalogued, stored, and ready for use.

Sorg Expands Converting Dept.; Increases Specialization

Substantially increased efforts toward specialization and upgrading have resulted from an expansion project recently completed by Sorg Paper Co. at its Middletown, Ohio, converting department. The firm, a manufacturer of a wide variety of high-quality printing and converting papers, has moved into the field of performing secondary processes on a portion of its production.

The expansion program got under way in 1951 with the installation of a Hudson-Sharp Machine Co. two-color



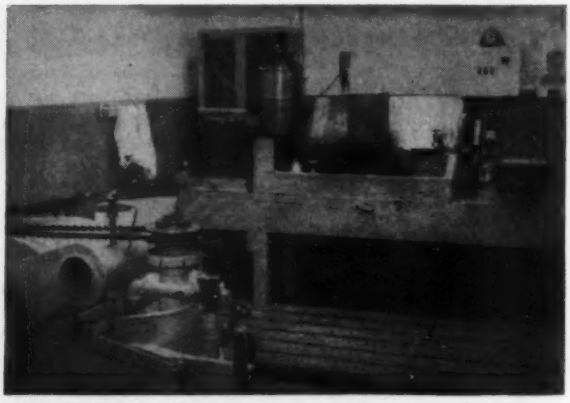
TWO-COLOR aniline press by Hudson-Sharp at Sorg Paper

GRAVURE PRESS in converting by American Type Founders

COATING MACHINE in expanded Sorg converting department

TISSUE FOLDING machine for Kaypee industrial wipes

HUMIDITY ROOM at Sorg's new laboratory



BEATER ROOM with minature beater in left foreground

aniline printing press, which by the end of this year will have printed more than 1,000,000 pounds of paper.

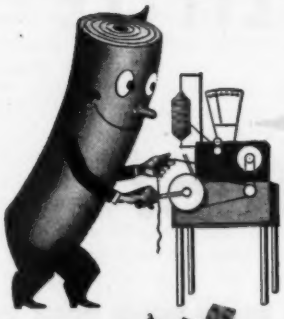
Just recently put into operation was a two-color gravure printing press manufactured by the Klingrose Division of American Type Founders Inc. One of the most modern plastic coating and film casting machines in the country is now making its initial runs. This equipment is by Dilts Machine Works, with the oven heaters made by Industrial Radiant Heat Corp.

Scheduled for delivery at the end of this year is a 42-inch H. H. Henrich Co. bag machine to be operated in conjunction with an aniline printing press. Production is planned for early 1953. This equipment will turn out notion and millinery bags with or without reinforced cut-out handles. (These products, together with printed wrapping paper, will be part of the Gardner-Sorg family packaging program. Gardner Board & Carton Co. will make and market matching folding boxes.)

Experimental equipment

The converting department also boasts one of the fastest rewinders available. The machine is the shear cut type, which eliminates the need for dusting, and has automatic tension compensation and electric eye side guide controls. The rewinder was manufactured by Cameron Machine Co.

A pilot coating machine and pilot laminator are also in operation in the Sorg converting department. This equipment is experimental and is being prin-



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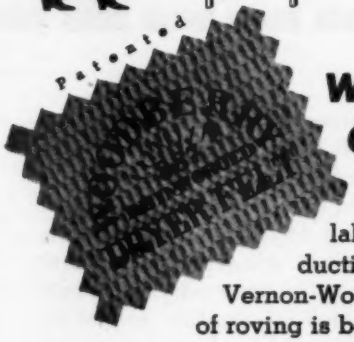
Makes the Big Difference In DRYER FELTS



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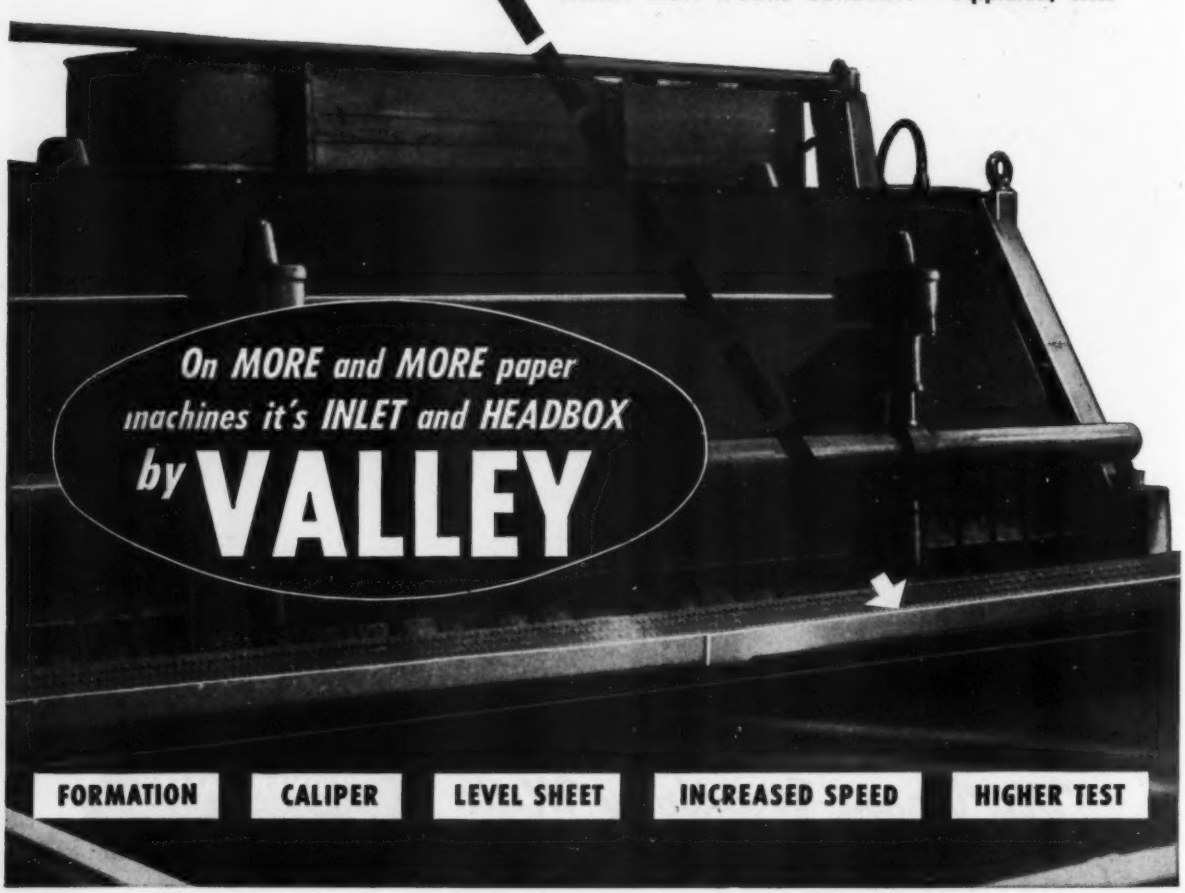


cipally used to develop a new method of applying a protective film to wallboard, plywood, steel, and other flat surfaces. The process is covered by patents assigned to Sorg.

New offices have also been constructed, covering 10,000 square feet. Space is provided for the technical, manufacturing, engineering, and standards departments. Included is a humidity room for paper testing.

The new main laboratory measures 30 by 50 feet and is claimed to contain the most modern equipment in the Miami Valley. Five lab benches, three having steel tops and two stone, are equipped with gas, air, and electric outlets, in addition to having connections for steam, and hot, cold and distilled water. The biological lab contains a new incubator and refrigerator.

Adjoining the main lab and the converting department is the plastics laboratory, which thus can be used by both technical and production personnel. Also nearby is a small "beater room" where test samples are mixed in a miniature beater.

Expansion Notes

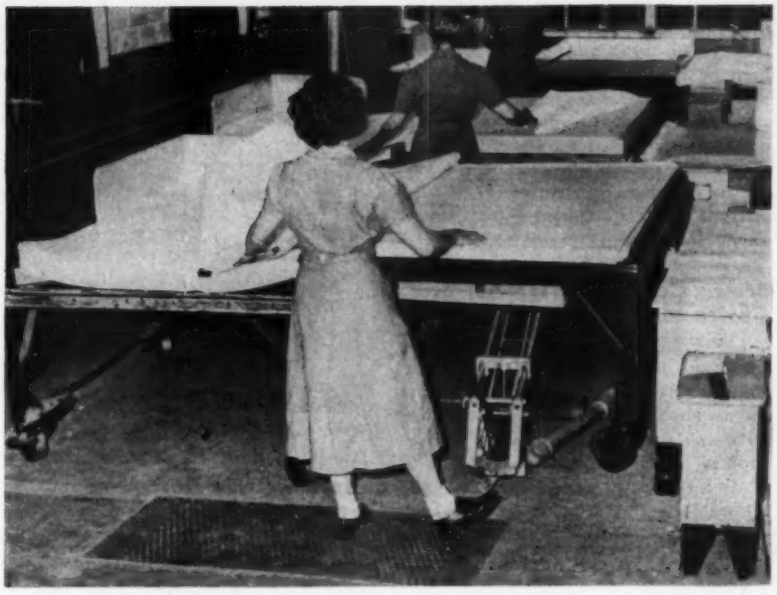
St. Regis Paper Co.
has announced completion of a multiwall bag plant at Tacoma, Wash. The operation is completely equipped to produce a full range of bags and includes six production lines, three printing presses, an art and engraving department, and auxiliary equipment. The plant replaces a leased factory formerly operated in Seattle.

Kimberly-Clark Corp.,
Neenah, Wis., is planning the construction of a 12-room one story guest house near its Lakeview mill. It is to include a lounge and dining room.

Marathon Corp.
has christened a new 259-foot cargo vessel the *D. C. Everest* in honor of the firm's board chairman. The ship was constructed in Kingston, Ont., at a cost of $1,000,000 and will carry pulp between the company plants at Marathon, Ont., and Oswego, N. Y.

National Container Corp.
has leased for its new executive offices and headquarters the second floor at 1834 Broadway, New York, N. Y. The office contains 30,000 square feet of floor space.

Erving Paper Mills
at Erving, Mass., is completing a new addition providing about 15,000 square feet of new floor space. The area is to be utilized for the expansion of the firm's custom-designed printed napkins. The announcement of the project was made by David Housen, president.



AUTOMOTIVE TRANSMISSION JACKS have been put to work on each of 50 inspection tables at Watervliet Paper Co.

Watervliet Installs Automotive Transmission Jacks

Watervliet Paper Co. at Watervliet, Mich., has installed automotive transmission jacks on each of 50 or more inspection tables to speed and simplify checking and sorting. The jacks make it possible to maintain paper stock at proper levels for the most efficient work.

The Aerol Lifts, manufactured by the Automotive Division of Cleveland Pneumatic Tool Co., are similar to jacks used in garage repair shops. No change in procedure or equipment is involved beyond the adoption and use of the jacks, to which simple wooden platforms made by Watervliet's carpentry shop have been added.

Leslie Succeeds Wilson as President at Hammermill

NORMAN W. WILSON, president of Hammermill Paper Co., Erie, Pa., since 1940, has resigned the presidency and has been elected chairman of the board, effective January 1. *DONALD S. LESLIE,* first vice president and general manager, will succeed Mr. Wilson as president while continuing as general manager.

DR. OTTO F. BEHREND, co-founder of Hammermill, and its treasurer throughout the corporation's 54 years, has announced his plans for retirement in May, 1953. He has been an industry pioneer in establishing laboratory control and chemical testing in the manufacture of pulp and paper.

HUBERT E. ROGERS, of New York, has resigned from the board of directors. *JOHN F. CONDON,* partner in the law firm of Rogers & Condon, New York, has been elected to the board to succeed Mr. Rogers.

Mr. Wilson joined the company in 1901 and was elected vice president and manager of sales in 1914, assistant general manager in 1919, and first vice president and general manager in 1929. He was a motivating force in the organization and development of the American Paper & Pulp Association, serving two terms as president of that association. He has also served as regional director of United States Pulp Producers' Association, a member of the board of trustees of the Institute of Paper Chemistry, president of Writing Paper Manufacturers Association and a member of the Import Committee of the Paper Industry.

N. W. Wilson

Dr. O. F. Behrend

Mr. Leslie joined Hammermill in 1928 as a member of the sales department. He was named assistant sales manager in 1929, assistant general manager in 1933, and was elected vice president and assistant general manager in 1935, at which time he was also elected to the company's board of directors and

executive committee. He was elected first vice president and assistant general manager in 1940 and, since 1943, has been first vice president and general manager. He is also trustee of the Institute of Paper Chemistry, first vice president of American Paper & Pulp Association, and a member of the executive board and director of the Middle Atlantic Region, United States Pulp Producers' Association.

Brown Co. Names Whittemore Chairman of the Board

LAURENCE F. WHITTEMORE, president of Brown Co., Berlin, N. H., has been named chairman of the board of directors. He became president in 1950 and will continue to serve in that capacity. He has been a member of the board of directors since 1941. His relationship with the company began in 1935 when he became a member of the stockholders' committee with regards to reorganization and served as sub-chairman of the group.

ERNEST H. MALING, senior vice president, who retired November 1, after 32 years of service, has been named vice chairman of the board of directors. He joined the firm in 1920 in the accounting department of the Portland office. In 1933 he was made comptroller, and in 1941 he became treasurer, with his office located in Berlin. In 1943 he was made vice president of finance and accounts and treasurer.

L. F. Whittemore

V. L. Tipka

Tipka Leaves Newsprint Service Bureau

VERNON L. TIPKA, who succeeded Royal S. Kellogg as secretary-treasurer of the Newsprint Service Bureau, resigned as of November 1 to become assistant to James Knight, president of of St. Lawrence Paper Corp. The St. Lawrence mill at Norfolk, N. Y., produces newsprint for its owners, the Knight newspaper group.

Western Newsprint Production Expected to Rise 39% by 1961

PRODUCTION OF NEWSPRINT in the western United States is expected to increase by 39 per cent during the next decade. According to a study published last month by the Stanford Research Institute at Palo Alto, Cal., by 1961 western consumers of newsprint will require 35 per cent more than at present, as contrasted with an expected 18 per cent rise in national consumption.

Institute economists predict that supply should keep abreast of demand until late in the 1950's if newsprint importation continues at present levels and existing mills increase production as scheduled. During 1951 western regional producers marketed about 93 per cent of their output in their own territory.

The study, sponsored jointly by western newspaper publishers and newsprint producers, anticipates no actual newsprint shortage, although it is possible that there will be shortages from time to time during the next decade at prices consumers are willing and able to pay.

Newsprint Still Tight, Fowler Tells Publishers

A gentle warning not to depend on the United States government for more or cheaper newsprint was given members of the Inland Daily Press Association meeting recently in Chicago by R. M. Fowler, president of the Newsprint Association of Canada.

The publishers were advised not to put too much faith in reports that the newsprint supply situation on this continent is becoming much easier. All that has happened, he said, is that there are fewer cases of publishers being unable to get their minimum needs. There are still quite a few who want more newsprint but can't get it.

"I know of no Canadian mill that has any unsold tonnage," Mr. Fowler declared. "Despite substantial increases in capacity, the Canadian industry is operating at above its rated capacity—between 102 and 103 per cent of the 1952 capacity figure." Increase in output this year, he said, would be about 175,000 tons over last year's production.

Mr. Fowler pointed out that while the urgency of U. S. demand has dropped off, there still is a large market for Canadian newsprint outside North America, and that shipments to that market have been increasing recently.

Currency Problems

"The total quantities and the proportion of Canadian newsprint production that now goes to countries outside North America are still a very long way below what they were before the war," the speaker continued. He predicted that as currency problems are solved, effective world demand would take much of the Canadian production, even if the U. S. developed its own sources of supply.

Mr. Fowler noted the recent efforts of the U. S. government to develop the manufacture of newsprint from southern forests and from waste products such as bagasse. He pointed out that there is nothing new in this research, and that first-grade newsprint requires wood such as is found in quantity in Canada only. "It was really not necessary for some of my U. S. publisher friends to go to Washington to play a game of blind man's buff with samples of bagasse paper," he commented.

The best way for U. S. publishers to assure their future supply of newsprint, the speaker declared, is to cease their nationalistic talk and continue to cooperate with their historic Canadian suppliers. "It does not require government financing or any other form of government intervention in your business or ours," he reminded them.

New Price Advance in Canadian Newsprint Hinted

Industry sources in Canada have reported that there is much dissatisfaction among newsprint producers because the $10 price boost of last June has failed to increase earnings. While it has been impossible to confirm this from Canadian newsprint producers, it is believed that rising production costs and continued currency exchange losses have destroyed the expected effect of the price hike from $116 to $126 a ton.

Canadian newsprint company earnings since June have failed to show a proportionate gain, and it is believed that producers are considering a new price increase. Trade sources doubt that an additional $10 would be necessary to restore balance, but report that a smaller increase "would probably do the trick."

(On November 27 it was announced in Toronto that Abitibi Power & Paper Co. is advising its Canadian customers that the price of its newsprint will be increased $10 a ton, effective January 1. Under the increase, the base area price will be $122.)

October Newsprint Statistics

Production in Canada (including Newfoundland) during October amounted to 502,791 tons and shipments to 486,159 tons. Output in the United States was 97,144 tons, and shipments were 97,789 tons, making a total North American production of 599,935 tons and shipments of 583,948 tons, compared with continental production of 592,814 tons and shipments of 595,201 tons in October of last year. This report was issued by the Newsprint

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Fig. 106-A not only looks better — it proves out better in performance. In any comparison, its long life, low upkeep record has never been surpassed. That is the true measure of valve cost — and it is the reason why industry's shrewdest buyers will settle for nothing less than Fig. 106-A quality.

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GET THIS FOLDER — Gives details of Fig. 106-A design, and "family" interchangeability. Ask your Jenkins Distributor for Form 189-A, or write Jenkins Bros., 100 Park Ave., New York 17.

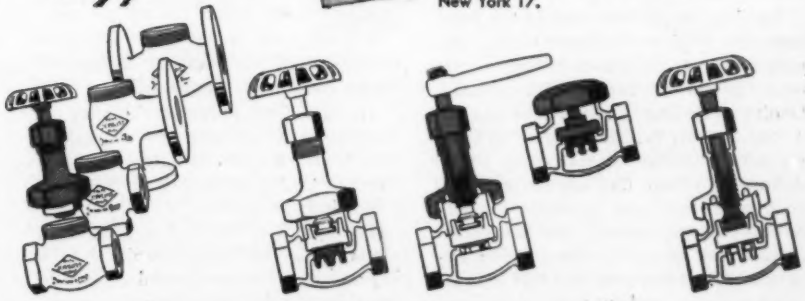


Fig. 106-A "Family" Interchangeability meets 90% of your valve needs with a small inventory of parts. Start with the standard Fig. 106-A. Trimming is interchangeable in Globe or Angle body, screwed or flanged. With a few parts, quickly-assembled combinations provide a Lift Check, a Spring-loaded Check, and valves for Stop and Check, Quick-opening, or Throttling service.

Service Bureau. North American output in October exceeded that of any month on record.

The Canadian mills produced 150,979 tons more in the first 10 months of 1952 than in the corresponding period of 1951, which is an increase of 3.3 per cent. The output in the United States was 33,225 tons, or 3.5 per cent, greater than that in the first 10 months of last year, making a total continental increase of 184,204 tons, or 3.3 per cent more than in the same period last year.

Stocks of newsprint paper at the end of October were 157,751 tons at Canadian mills and 8,661 tons at United States mills, making a combined total of 166,412 tons, as compared with 150,425 tons on September 30 and 158,346 tons at the end of October 1951.

Site Chosen for Ohio Newsprint Mill

Portsmouth, Ohio, has been chosen as the site for the construction of a newsprint mill costing an estimated $30,000,000. Spokesman for the interests that will erect the mill is O. R. Emigh of Columbus, Ohio. The plant, to be built on 43 acres owned by the Portsmouth Chamber of Commerce, will be operated by Emigh Ohio Valley Newsprint Co. and will be known as United Newsprint Mills.

It has been reported that 100 tons per day will be rolling from the mill by late next year. The plant would have a full production capacity of 200 tons daily. Newspapers are to be reclaimed by a bleaching process and reprocessing method followed in other sections of the country. Employment will be 1,500.

DEDICATING KEENAN BRIDGE, President Laurance F. Whittemore (r) congratulated J. P. Keenan

LOADING LONG LOGS onto Diesel trailer trucks during the Third Annual Woods Field Trip

Mechanized Lumbering Demonstrated During Brown Co. Woods Field Trip

The maximum utilization of New England forests with the minimum of production costs through the use of mechanized lumbering operations was demonstrated this fall at the Third Annual Woods Field Trip sponsored by Brown Co., Berlin, N. H. Host for the group was Laurence F. Whittemore, president of the firm.

A feature of the day was the dedication by President Whittemore of a 170-foot trailer truck bridge. Named in honor of 84-year-old James P. Keenan, retired woods superintendent, Keenan Bridge spans the often angry Big Magalloway River and is part of a 21-mile, two-lane modern truck highway that has opened up a vast forest area of approximately 100,000 acres to the harvesting of hardwoods, as well as softwoods.

Touring the private roads in the Parmachenee Region of western Maine, the guests saw huge cranes lifting entire trees—up to 32 feet in length—and loading them onto Diesel trailer trucks. These are then sped to the mills in Berlin, where instead of converting them directly into pulp, they are cut into the most productive and profitable lumber. Some of the trees are cut into first-grade lumber, and those that are suitable are utilized for veneer and furniture woods. The balance is used for pulp.

After viewing the mechanized operations, the guests visited Lost Brook Camp, where they inspected the modern facilities of the woodsman. Portable camps built to accommodate 15 men each, having insulated walls and oil heat, electric lights and refrigerators, together with showers, are the latest word in comfort.

During luncheon served at the camp, President Whittemore addressed the group. He in turn introduced Maj. Gen. Howard Kennedy of Ottawa, Canada, an authority on woodlands. Gen. Howard stated that, "After a careful study of this northern New England area, which I have made at the request of Brown Co., I am convinced that it has the greatest potential of any area in the northeast or in eastern Canada."

Concluding the day's activities, the guests inspected the various phases of Brown's reforestation program, running the gamut from seedlings to selective cutting.

Experiment to Reduce Odor from Nekoosa Kraft Mill

The first experiment in the state of Wisconsin to alleviate the unpleasant odor from a kraft mill has been undertaken at the Nekoosa mill of Nekoosa-Edwards Paper Co.

The chemical treatment was begun on a trial basis October 6. While definite improvement has been noted already in the mill and in the community, a decision as to whether the treatment will continue on a permanent basis depends on results obtained from the present 30-day trial period, as well as the cost and other factors.

The material used is a new product developed about a year ago by E. I. duPont de Nemours & Co. Tailor-made for the pulp industry, it is known as Alamask P-3 Concentrate and is a compound of synthetic aromatic chemicals.

According to J. C. Moertel, odorologist and duPont representative, the product does its job by "re-odorizing" or masking the obnoxious odor resulting from the kraft process. Mr. Moertel has declared that the Alamask produces a "spice-like" odor when added in the proper proportions to pulp.

The procedure is reported to be relatively simple. A small quantity of Alamask (approximately 28 ounces to a 6-ton batch) is poured into the digesters immediately after the chips are loaded. The compound is dissolved in the cooking liquor and thus goes through the entire pulp-making and recovery systems.

A series of "snifter" tests are being conducted at various key points throughout the pulp mill during the 30-day trial to determine what effect the Alamask is having on the familiar odor associated with kraft mills.

According to Mr. Moertel, the Alamask treatment is currently undergoing experimentation in several other mills.

Estimated cost of the "re-odorizing" treatment for the Nekoosa mill is about 22 cents per ton of pulp, or in the neighborhood of $1,000 a month.

High Wisconsin Wage Rate Cited

The average weekly earnings of workers in Wisconsin's 82 pulp and paper mills amounted to $71.67 during 1951, which is $2 more than the all-industry average, William H. Clifford, vice president of Kimberly-Clark Corp., said recently.

Papermaking is the second largest industry in the state—measured by dollar output, he declared. Machinery manufacturing ranks first, while malt beverages reach only about half the dollar output achieved by the paper industry.

St. Regis Won't Move Deferiet Mill: Ferguson

Roy K. Ferguson, head of St. Regis Paper Co., has denied that the firm has any plans for moving its Deferiet, N.Y., mill to a new location "in the South, the Southwest, or anywhere." In Defereit to address a testimonial dinner for employees, he declared that rumors to the effect that the company is planning a move "are completely unfounded."

"The Deferiet mill is a permanent part of the St. Regis institution," Mr. Ferguson said. "It is economically sound from every angle. Raw materials are available for the special type of paper made here, and transportation costs are kept at a minimum. This plant has also developed techniques and technical know-how that could not be instituted elsewhere as successfully as they have been here. The idea of a move is ridiculous—now or at any other time in the foreseeable future."

Dwight Stocker Resigns Western Michigan Post

Dwight Stocker, president of Kalamazoo Vegetable Parchment Co., has resigned as vice chairman of the advisory committee of the pulp and paper technology curriculum at Western Michigan College. In quitting he said that he felt that KVP was already well represented by the membership of John Wood, executive vice president. Mr. Stocker is former president of Michigan Paper Co. in Plainwell, having taken the KVP top spot in mid-October.

Elected to replace him on the committee was Martin Galbraith, technical director of Sutherland Paper Co. Chosen as the new vice chairman was F. C. Goodwill, resident manager of the St. Regis Paper Co. plant in Kalamazoo. The advisory committee in headed by F. B. Curtenius, treasurer of Kalamazoo Paper Co. and president of Kalamazoo River Improvement Co.

ROADBINDER SALES at Kimberly-Clark Corp. in Neenah, Wis., have indicated the possibility of a permanent market for the firm's sulfite waste liquor; specially equipped trucks spray the material on county and township roads in central and northern Wisconsin as part of extensive tests being conducted in the region

Crown-Zellerbach Markets By-Product of Sulfite Waste

ENCOURAGING RESULTS have been reported by Crown-Zellerbach Corp. at San Francisco in the marketing of a new chemical by-product that may turn waste material into profit. The by-product is known as "Orzan" and is used in farming to stimulate plant growth.

As a part of C-Z's efforts to reduce stream pollution, Orzan is the result of long study in the firm's laboratories. According to Alfred B. Layton, C-Z vice president, considerable evalution of the product remains to be done before it can be supplied in quantity. It is presently being investigated under fellowships at Oregon State College, and two or three years will be required before it can be fully tested.

Orzan is being produced at the firm's Lebanon, Ore., mill. It is potentially available at the rate of about 60 tons per day from this one mill, which uses the ammonia base sulfite cooking system.

Mr. Layton has declared that the development of Orzan is near the point where it is pressing for full-scale production and commercial distribution. The product stimulates plant growth in about the same degree as fish meal. Nitrogen is contributed to the soil from the ammonia content in a form readily converted to plant food. The sugar content supplies food for soil bacteria. The lignin aids in the improvement of soil structure.

Additional applications of Orzan have been described by Mr. Layton. He said Orzan may be used as a versatile dispersing agent in asphalt emulsions, gypsum, oil well muds, clays and slips, sprays and many other organic and inorganic mixtures. He said it is also satisfactory as a binder for such applications as cores in foundry work, fuel briquettes, hardboard, and surface for unpaved roads.

"As a base for adhesives," Mr. Layton declared, "it can be incorporated in synthetic resin plywood glues, in linoleum cement, and in a variety of other industrial adhesives."

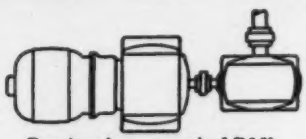
Northern Paper Resumes Work on Project to Reduce Pollution

Construction is going ahead rapidly on the last of the new buildings that Northern Paper Mills, Green Bay, Wis., is putting up in its project to reduce sulfite pollution in the Fox River. Structural steel and much of the necessary heavy equipment have been received after delays due to defense scarcities. The final unit now under construction is a $1,000,000 boiler house that will give the mill capacity for burning as industrial fuel its spent sulfite liquor that previously had to be flowed into the river.

The massive steel framework of the structure already towers 78 feet above the ground. Two huge drums totalling more than 100 tons in weight were

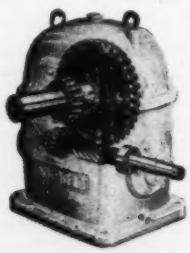
Ask yourself these speed reduction questions . . .

1 Do I want high-ratio reduction with right-angle takeoff?



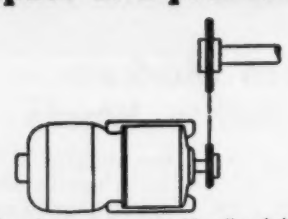
Drawing shows motorized P.I.V. variable speed and worm gear drives direct-coupled.

Then your answer is a LINK-BELT Worm Gear Drive



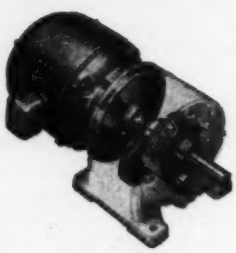
Reduction ratios: 3.3:1 to 8000:1
Torque: 1,400 to 123,000 in. lbs.
Output shaft rpm: 0.22 to 564

2 Is space at a premium?



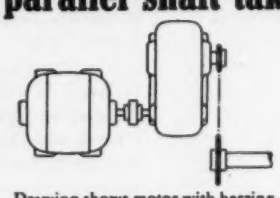
Drawing shows gearmotor with roller chain drive.

Then your answer is a LINK-BELT Gearmotor



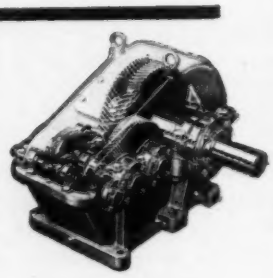
Reduction ratios: 6.2:1 to 292:1
Hp range: 1 to 30
Output shaft rpm: 6 to 280

3 Will I need high hp capacity with parallel shaft takeoff?



Drawing shows motor with herringbone gear and roller chain drives

Then your answer is a LINK-BELT Herringbone Gear Drive



Reduction ratios: 2.84:1 to 318:1
Hp range: ½ to 1000
Output shaft rpm: 2 to 600

Yes, LINK-BELT builds all 3

WHATEVER factor governs your speed reducer selection—ratio, space, shaft position, shock loading—you can get the exact answer to your needs from Link-Belt's complete line of enclosed gear drives.

For Link-Belt builds a full range of sizes and ratios in all three types—Helical, Herringbone and Worm. When a Link-Belt power transmission engineer analyzes your conditions, he can recommend the specific drive to meet your specialized requirements.

For complete information, call the Link-Belt office near you.

LINK-BELT

ENCLOSED GEAR DRIVES

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities. 12,000

hoisted high into the frame during October, and workmen were to begin connecting them with the dozens of boiler tubes. Two large fuel pulverizers, boiler feed pumps, fly ash collectors, and all the boiler breeching are already on the site.

Bricklayers were to begin enclosing the steelwork with masonry during the early part of November. Large openings were left unbricked for several weeks at the lower levels to permit moving the boiler and furnace units into place.

Northern Paper already has waiting a building to house the stainless steel evaporators that will concentrate the spent sulfite liquor to a density that can be burned. Also, all auxiliary equipment is on hand for the evaporators, and much of it is already installed. The evaporators were ordered 21 months ago and ever since have been awaiting release of the required stainless steel, which is under strict federal control. Latest word from the fabricator is that the first part of this equipment was to be shipped last month, with the remainder following as rapidly as it can be assembled.

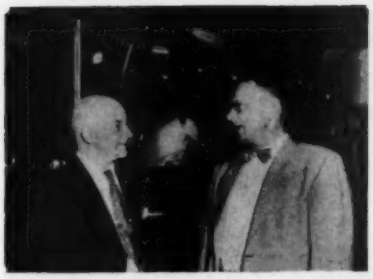
St. Regis Reports on Anti-Pollution Work at Jacksonville

John K. Ferguson, resident manager for St. Regis Kraft Corp. at Jacksonville, Fla., has told members of the Jacksonville Chamber of Commerce that his firm has spent approximately $750,000 on equipment to keep the new Eastport pulp mill from polluting the air and the St. John's River. He added that the firm had done the work both as an investment in public relations and as a part of a project for the reclamation of chemicals for further mill use.

The equipment consists of two separate systems that will discharge the mill's waste products. One is an elaborate unit that will remove about 95 per cent of the odor and the solid by-products from the plant's smoke discharge. The other consists of a huge pipeline that will empty fluid waste far out at the river bottom in an effort to minimize the effects on fish and to prevent the wastes from rising to the surface and washing to shore.

Mr. Ferguson said that nearby residents will notice little, if any, difference in the atmosphere or the river as a result of the anti-pollution equipment. Mr. Ferguson added that the company installed the apparatus because the pulp and paper industry has recognized that "providing a payroll for a community" is not enough to maintain good public relations.

Construction on the mill was started two years ago by St. Regis Kraft, a subsidiary of St. Regis Paper Co. Mr. Ferguson explained that Jacksonville was chosen as the site because of the area's ready supply of water and fuel, its labor market, its transportation and communications system, and its proximity to timber sources.



ON THE SOUND STAGE at Wilding Pictures Inc. during the filming of the Gilbert motion picture are T. M. Gilbert (left) and actor Barry Hopkins

Gilbert Film Depicts Making and Use of Business Papers

"The Paper Made for You" is the title of a sound motion picture film recently released by Gilbert Paper Co., Menasha, Wis. The movie shows the manufacture and use of business papers.

The film has been directed to tie in the major manufacturing operations of papermaking directly with the user benefits. In that manner it is felt that the viewer will not only get a comprehensive idea of how paper is made but will also be able to relate what is done at the mill in terms of his own usage. For example, in the tub-size, air-dry operation, not only is the mill process shown, but, in addition, the camera shows the printer's plant and the ultimate consumer's office.

"The Paper Made for You" runs approximately 23 minutes. It was produced for Gilbert by Wilding Pictures Inc. of New York, Chicago and Hollywood. It is being distributed nationally through the 27 offices of Modern Talking Picture Service Inc.

C-Z Flows Waste into River With State's Approval

Sulfite liquor waste from the Crown-Zellerbach Corp. mill at West Linn, Ore., is flowing directly into the Willamette River again in order that the river dike at the 19-acre retaining pond may be reinforced. The state sanitary authority gave approval for direct release of the waste.

A spokesman said that the temperature of the river water had dropped sufficiently so that the outpouring of the sulfite liquor will not materially affect the oxygen content. An extra load of material backed up in the retaining pond during the recent long dry period has caused some sloughing of the dike on the river side. A dredge has been put to work reinforcing the dike to eliminate the threat of the 66,000,000 gallons of sulfite waste breaking through the retaining pond built this year.

Officials had estimated that the pond would hold the waste produced over a four-month period, but more than five months have elapsed since the low-water mark was reached in the river. The pond was constructed to prevent the waste from polluting the stream during periods of very low water. Once rainfalls have boosted the river flow, the pond will be gradually emptied for next summer's storage.

Potlatch Forests Inc.,
Lewiston, Idaho, has announced plans to extend its effluent waste line from the pulp and paper mill two miles west to empty into the Snake River. The effluent now discharges into the nearby Clearwater River. An increase in plant expansion has made the change necessary, according to Roy Huffman, assistant general manager.

Rayonier Expands Wood Utilization Program

The inauguration of a program to make greater use of waste woods in the Grays Harbor Division of Rayonier Inc. has been announced at Hoquiam, Wash., by George A. Holt, resident manager.

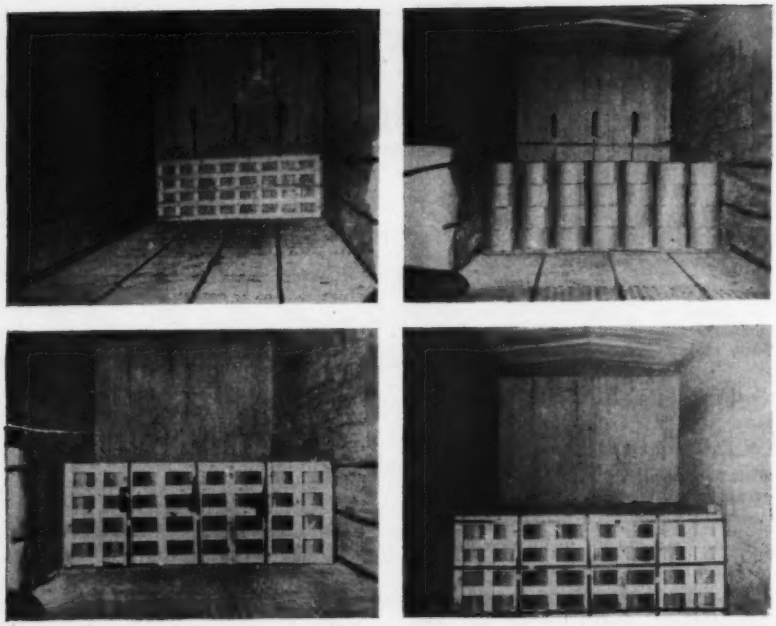
The move is in line with Rayonier's company-wide program to conserve wood resources by exploring every avenue for the maximum utilization of waste woods. With proper study, it is believed possible for the Grays Harbor mill to make use of various types of waste woods that heretofore have not been suitable for making the firm's high-grade pulps.

Anton Gustin, who has been associated with mills in both Canada and the United States, has been appointed to coordinate the program. Working with Rayonier's timber division and the central engineering office, in addition to the mill management, he will devise techniques and equipment to permit the fullest wood utilization. Prior to his new appointment, Mr. Gustin was pulp mill superintendent at Grays Harbor. He is to be succeeded by Steve Rupert.

Wood Pulp Production Equals Last Year

Production of wood pulp throughout the nation is running neck-and-neck with 1951's record output, while consumption is about 5 per cent below the 1951 figure. These trends were noted by L. Turcotte, president of Puget Sound Pulp & Timber Co., in his survey covering the first nine months of this year.

Pulp production (all grades combined) totaled 12,227,000 tons this year, as against 12,364,000 tons last year. Imports totaled 1,341,000 tons this year,



"CONTROLLED FLOATING LOADS" have virtually eliminated all damage to products during transit, according to Central Waxed Paper Co., Chicago; in addition, loading time has been cut by 50 per cent. To prepare the car for a controlled floating load *(top left)*, Central Waxed positions the steel strapping and rear gate; after placing strips of cardboard over controlades and along the floor to prevent scuffing, 10 rows of rolls are stowed in this half of the railway car *(top right)*; after each half-car unit has been completely stowed, the vertical straps are joined, tensioned, and sealed across the front gate *(bottom left)*; the bracing is completed by tensioning and sealing the horizontal straps *(bottom right)*

down from 1,825,000 in 1951. Exports of American-made pulp rose to 162,000 tons in the 1952 period, compared to 136,000 tons last year. Consumption in the United States of both domestically produced and imported pulp amounted to 13,406,000 tons in this year's first nine months, against 14,053,000 in the same period last year. This decline in consumption was accounted for principally by the decrease in imports.

Consumers of market pulp used 2,554,000 tons during the first nine months, down from the record figure of 3,084,000 tons last year. This difference is also explained by the decrease in imports.

"While not equalling last year's all-time record," Mr. Turcotte noted, "new supply provided by domestic production and imports in 1952 will probably exceed the 1950 total by a full 1,000,000 tons and will top any previous year by more than 2,000,000 tons."

Bananas for Paper

Discovery of a new formula for the manufacture of "excellent" kraft paper from banana stumps has been reported by the Indian government's Handmade Paper Research Center at Poona, Bombay State. The formula employs a mixed pulp of banana and jute in the proportion of 60 to 40 per cent.

It has been estimated that in Bombay State alone if only half of the available raw material were used, about 6,750 tons of paper pulp could be produced. With the addition of jute, the net yield of kraft paper is estimated at about 11,500 tons.

The practical difficulty of utilizing banana stumps for large-scale industrial production is that large quantities of the raw material, with its 93 per cent water content, must be transported to distant mill sites. The research center has suggested that one unit of production should be established for every four acres of banana field.

Customs Courts Cases

Nearly 50 new cases have been docketed for trial in the United States Customs Court in which importers are protesting against duty rates levied by Customs officials, according to a report issued by Warren B. Bullock, manager of the Import Committee of the American Paper Industry. Among them are the following:

Twenty-six cases involving claims of importers for lower rates of duty on napkins imported from England, Denmark, and Holland, some being of crepe; five shipments of hand made paper claimed to be dutiable at the lower rate for drawing paper; two cases in which importers of prayerbooks protest against the imposition of duty rate for Bible paper on the weight of the entire book, not merely the Bible paper content, and 14 cases in which Finnish paper has been held to have been undervalued. Eight of the cases involved kraft wrapping imported at Boston, one of sulfite at Cincinnati, three of sulfite at New York, and two of greaseproof paper at New York.

Customs officials are seeking to determine proper duty rate for a series of new type papers being offered in the U.S. market. Among them are the following:

Esparto paper from France; yellow box covers imported at New Orleans claimed to be dutiable as wrapping paper; novel news imported at Buffalo claimed to be duty free as standard newsprint; highly finished bleached kraft paper claimed to be dutiable at the low rate for kraft wrapping paper, and greaseproof paper for eventual use in photography.

Duty Rate Reductions

As a result of complaints from abroad, the State Department has announced it will continue to strive for duty rate reduction in an effort to expand trade with other nations, and that the Tariff Commission should confine any increase in rates under the escape clauses of the Reciprocal Trade Agreements to cases involving genuinely serious injury.

Various countries have protested against the efforts of some domestic industries to secure relief from injury caused by the low rates of duty set in trade agreements. Several nations have become restive at the imposition by this country of quotas on various products and have intimated that they will take retaliatory measures.

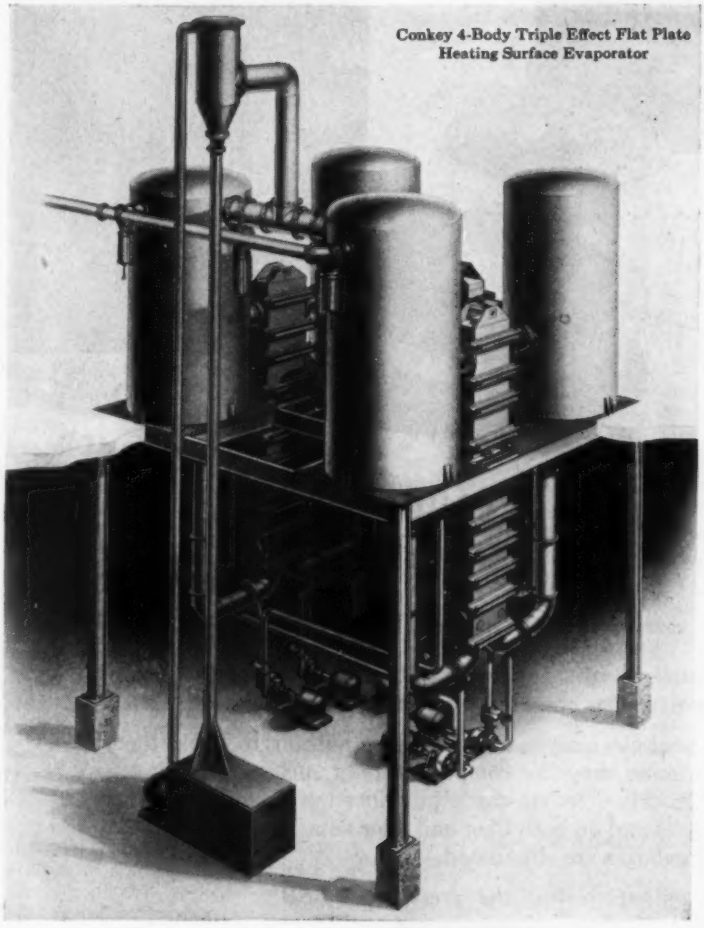
The Senate finance committee has taken testimony on the so-called Customs Simplification Bill previously passed by the House. The paper industry in its appearance before the committee pointed out that the elimination of foreign value as a basis for the determination of duties and the substitution of export value would encourage the formation of foreign price cartels. Some such cartels have in the past controlled production in such a way as to establish dutiable values lower than those customary in the foreign field.

The World Bank has granted Finland a loan of several million dollars for the improvement of its paper and pulp industry. Previous loans by this country have increased the volume of Finnish paper available for export to the United States market.

11 Shipments Held Undervalued

Seven shipments of kraft wrapping paper at Philadelphia and three of kraft wrapping, as well as one of greaseproof paper, at New York, all from Finland, have been held by Customs officials to have been undervalued, and the im-

NO shut down time! stream pollution! scale removal costs!



Conkey 4-Body Triple Effect Flat Plate Heating Surface Evaporator

Conkey Flat Plate Heating Surface Evaporator *with Rosenblad Switching System**

The proven system for avoiding stream pollution by sulphite pulp mill waste liquors that proved so outstandingly successful in commercial installations all over Scandinavia, is now adapted for use in this country by General American. *In every instance* where a Rosenblad Switching System has been installed, shut down time *and* scale removal *costs have been practically eliminated!* The Rosenblad System utilizes the condensate wash as a descaling operation carried on during full capacity operation of the evaporator. Surfaces subjected to boiling liquor are periodically switched with those in contact with vapor and condensate to clean heating surfaces during normal continuous operation. *Every part* of the equipment is switched, consequently scale is washed away from pipe lines, valves and vessels . . . in addition to heating surfaces.

At present in this country . . . Rosenblad Switching Systems in Conkey Flat Plate Heating Surface Evaporators are being constructed for full scale commercial operations. *Write today for detailed bulletin.*

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Other General American Equipment:
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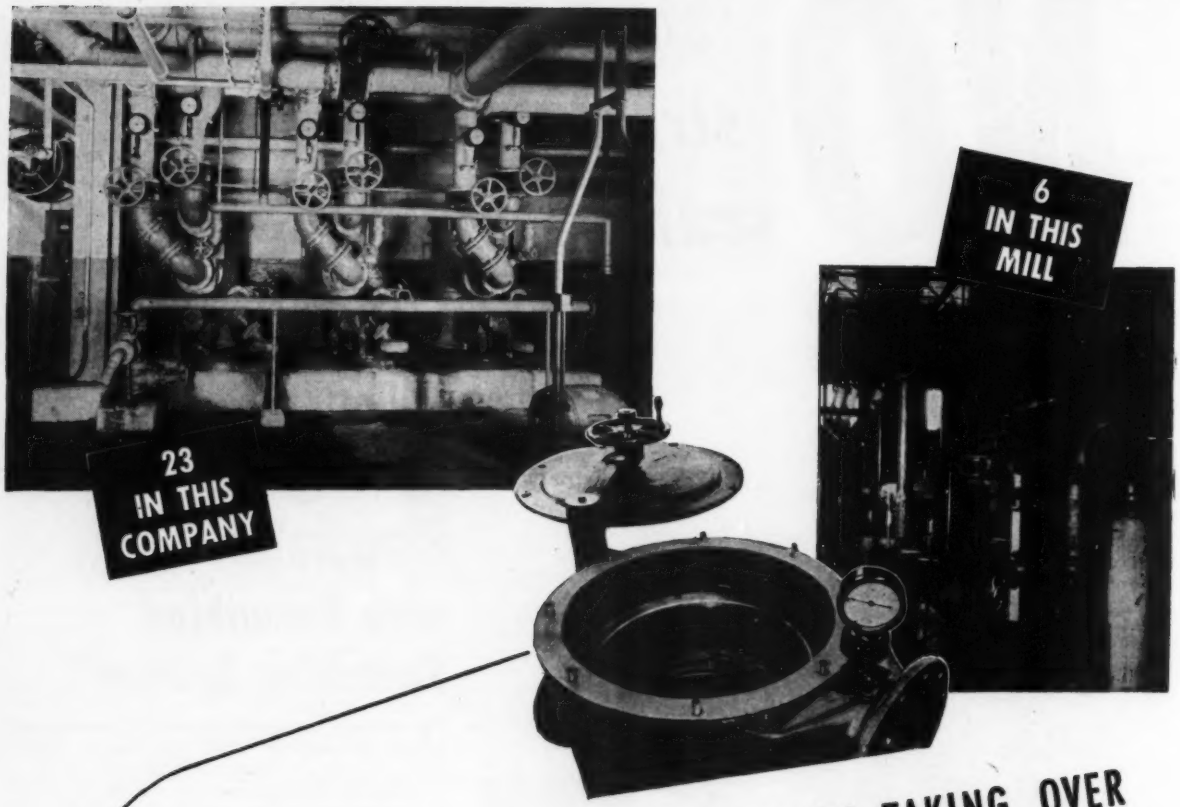

SHARTLE SELECTIFIER* SCREENS GRADUALLY TAKING OVER

The "screens" of this new type shown above are just nine of the twenty nine operated by just two companies.

For a final cleaning operation there's nothing to equal them. What's more they are compact, totally enclosed and clean. Installations are made just ahead of Fourdrinier headboxes and on both liner and filler vats. In many cases mixboxes are eliminated.

A new bulletin just off the press. No. 13-SB

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SHARTLE

SHARTLE BROS. MACHINE COMPANY

MIDDLETOWN, OHIO

DILTS MACHINE WORKS, Fulton, New York
Divisions of THE BLACK-CLAWSON COMPANY, Hamilton, Ohio
Subsidiary: B-C INTERNATIONAL, LTD., London, S. W. 1, England
Associate: THE ALEXANDER FLECK LIMITED, Ottawa, Canada
Western Sales Office: Mayer Bldg., Portland, Oregon
Southern Sales Office: 685 W. Peachtree St., N. E., Atlanta 3, Ga.
Northern Sales Office: 814 N. Superior St., Appleton, Wisc.
Northeastern Sales Office: Dilts Machine Works Div., Fulton, N. Y.

porters have asked a court review of the rulings.

New problems under consideration by Customs officials include the following: paper from Newfoundland claimed to be duty free as paper stock being narrow width side runs, believed to be dutiable as printing paper because not so mutilated as to be unusable as paper; paper from Germany entered at the low rate for drawing paper, believed to be properly dutiable as bristol; carbonized paper, over 10-pound basis weight, claimed to be dutiable as carbon paper at 1¼ cents per pound and 3¾ per cent, believed to be outside the weight limit for such a classification, and dutiable as coated paper at higher rate; paper with colored surface liner and white base, described as elephant hide, imported from England, under investigation to determine whether it is laminated or coated; nine-point kraft from Sweden claimed to be dutiable at 10 per cent as kraft paper, believed to be dutiable at 30 per cent as paper not specially provided for; toweling in 250-foot rolls claimed to be dutiable as paper cut into shape, believed to be dutiable at the higher rate as machine-creped paper.

Industry Notes

Weyerhaeuser Timber Co.'s annual report has been judged best in the building materials industry in the *Financial World* yearly competition. This is the third year that Weyerhaeuser has been so honored. Building materials runners-up were National Gypsum Co. and The Flintkote Co.

Tileston & Hollingsworth Co. of Boston has named a junior board of directors to enable members of the organization other than top officials to contribute to the management of the firm. According to Amor Hollingsworth Jr., president, reports that this move is intended to give the company the joint experience of age and the aggressiveness of youth in planning for the future.

The German Motorship *M. S. Elfriede* recently loaded 350 tons of newsprint at Cheboygan, Mich. The cargo was consigned to Bremen, Germany.

The First Shipment of newsprint to a foreign port was loaded at Albany, N.Y., recently as the Port of Albany began operating. Nine hundred tons of newsprint from Gould Paper Co. at Lyons Falls were loaded aboard the Swedish ship *Sameland* for shipment to Santos and Rio de Janeiro, Brazil. Frank W. Dunham Jr., port general manager, said it is hoped that newsprint shipments will become a regular part of the port's traffic.

$65 Million Celgar Plan Approved with Provisions

APPROVAL HAS BEEN GIVEN by the British Columbia provincial government for the granting of a forest management license to Celgar Development Co., subsidiary of Celanese Corp. of America. The license covers 960,000 acres in the Arrow Lakes region. Certain provisions were attached to the approval.

The company may now go ahead with plans to produce lumber, sulfate pulp, newsprint, and dissolving pulp at Castlegar, which is located at the southern end of the Arrow Lakes in the province's Kootenay district.

The several provisions in the license call for:

1. The establishment of three public working circles for the use of small operators now using the area. This will give the small operators an annual yield of nearly twice the volume of timber now produced.

2. Celgar is required to have a reasonable percentage of its annual crop removed by local operators.

3. No foreshore rights have been granted. Anyone may enter and use the licensed area for recreation, prospecting, or any legitimate business. The government may withdraw any part of the area from the license for higher economic uses, such as agriculture, mining development, industrial development, or the establishment of townsites. However, the major portion of the management area is now only useful for growing trees.

4. Roads in the licensed area will be open for public use on Sundays and on statutory holidays.

5. Mining interests within the licensed area will be permitted to use timber based on their need. No overcutting will be allowed, but the land must be used to capacity and not kept as a backlog of mature timber.

6. All areas that do not restock naturally must be reforested by planting.

If Celgar accepts these provisions, it is expected that the firm will go ahead with the full development of the region as planned, but any more details will not become known officially until the signing of the actual contract on the approval of the forest management working plan.

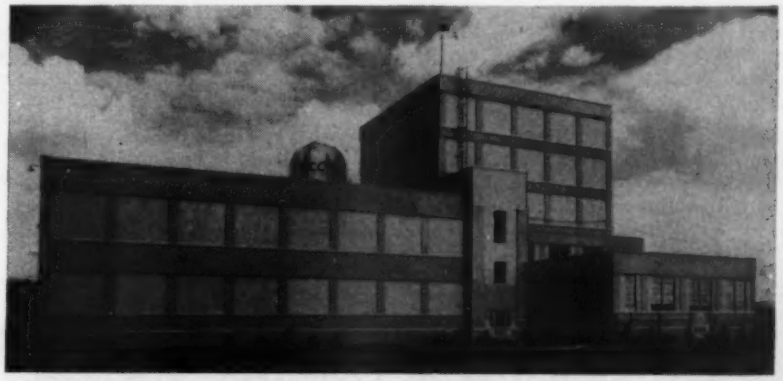
The firm has already purchased three mills in the Arrow Lakes area, with a combined capacity of 35,000,000 board feet a year. The mills were owned by William Waldie & Sons Ltd. at Castlegar; Big Bend Lumber Co. at Nakusp, and Columbia River Timbers Ltd., near Revelstoke.

Prior to the granting of the license, the government dismissed appeals against it by Glacier Lumber Co., Kootenay Forest Products, and William T. Joyce Co.

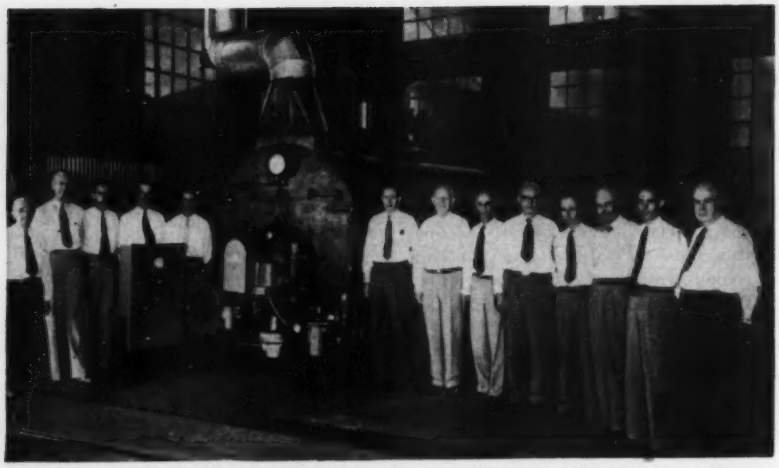
Lunkenheimer Establishes New Central District

Establishment of a new Central District has been announced by Harold H. Layritz, central sales manager of The Lunkenheimer Co., Cincinnati valve manufacturer. The new district, headed by Elmer R. Tieberman, is to be divided into five territories. Mr. Tieberman will maintain headquarters at Dallas.

Marshall N. Stickel, with headquarters at Houston, will have charge of northeast and southeast Texas and southwest Louisiana. Joseph A. Birkhead will be in charge of the southwest Texas territory, headquartering at Houston. D. R. ("Dave") Davis will be in charge of the Oklahoma, Kansas and western Missouri territory, with headquarters at Tulsa. William A. Boles, with headquarters at Baton Rouge, La., will direct the southeastern and northern Louisiana,



FIRST MAJOR expansion in the United States hydrogen peroxide facilities in recent years is this new Vancouver, Wash., plant of Buffalo Electro-Chemical Co. Inc., division of Food Machinery & Chemical Corp.



INSPECTING THE NEW BOILER-BURNER unit are executives of Kewanee-Ross and Iron Fireman; to the far left are W. B. Russell, president of K-R, and C. T. Burg, sales vice president of Iron Fireman

Kewanee-Ross, Iron Fireman Join Resources in Project

Two entirely separate companies, without financial or corporate connection, have collaborated in the engineering, manufacture and sale of a major piece of equipment. Kewanee-Ross Corp. of Kewanee, Ill., and Iron Fireman Mfg. Co. of Cleveland have joined forces to develop and market the new Kewanee-Iron Fireman boiler-burner unit.

The new unit is available in models for oil, combination oil-gas, and gas. Sizes range from 39 to 304 hp, or the equivalent, for the production of high or low pressure steam or hot water. According to the manufacturers, the units include all combustion controls installed in a pre-wired control panel, forced draft equipment, eliminating the need for a high stack, and an oil preheating system. The burner portion of each unit is completely assembled and tested at the Iron Fireman plant in Cleveland. The boiler portion with all accessories is fully assembled at Kewanee and mounted on permanent steel skids.

southern Mississippi and southwestern Arkansas territory. Byron P. Roland has been made representative in charge of the west Texas and New Mexico territory, headquartering at Midland, Texas.

These changes were made at the direction of Harry A. Burdorf, vice president in charge of sales.

Worthington Establishes New Transmission Division

Headquarters for the sales, engineering and production of Multi-V-Drives and All-speed Drives have been consolidated at the Oil City, Pa., plant of Worthington Corp., according to an announcement by E. J. Schwanhausser, executive vice president.

A new division to be known as the Mechanical Power Transmission Division has been set up to handle Multi-V-Drives, which were formerly manufactured at Worthington's Buffalo and Wellsville, N. Y., plants, and Allspeed Drives, formerly made at Holyoke, Mass. Sales functions of the new division are under the direction of D. E. Tessendorf, manager, and H. W. Kumro, assistant manager. Fred G. Moore has been named the division's chief engineer, while manufacturing operations will be under the direction of W. F. Weinreich, works manager at Oil City.

Some 150,000 square feet of manufacturing and warehousing floor space has been allocated to this consolidated operation. A new green sand department in the foundry is in operation with a capacity of 18 tons of sheave and hub castings per day. Production of the castings at the Oil City plant in conjunction with the machining and processing of these products will result in improved efficiency and handling of customer requirements.

Mr. Schwanhausser emphasized the benefits resulting from this consolidation as: (1) quicker service to customers and dealers by centralization of records at one plant; (2) more efficient control of production and inventory by centralized manufacture and shipment, and (3) increased flexibility of production facilities with elimination of duplication of equipment and operations formerly carried on at two or more locations.

American Cyanamid Expands Paper Chemicals Department

Three new positions have been created in American Cyanamid Co.'s paper chemicals department, according to a recent announcement by J. M. Walsh, department manager. Improved service to customers in the paper industry was cited as the reason for the move.

A. C. Bates, formerly New England district manager for the Industrial Chemicals Division, has been named eastern regional manager. He will supervise sales of all paper chemicals in an area that includes New England and other Atlantic seaboard states extending as far south as western Virginia. Mr. Bates will headquarter in Boston.

K. E. Youngchild, formerly product supervisor of paper resins in New York, was named southern regional manager, with headquarters in Mobile, Ala. He will supervise chemical sales in an area extending from Richmond, Va., to and including Texas and Oklahoma.

George E. Fromm, former product supervisor of wax and rosin sizes in New York, has been made western regional manager, with headquarters in Chicago. He will be in charge of all midwestern and western sales.

Bird Machine Co. has opened Pacific Coast sales and service headquarters in the Portland Trust Building, Portland, Ore. Blanchard Warren is in charge. He has been associated with Bird for 25 years.

$2 Million Sulfur Dioxide Plant Begins Operation in Ontario

CANADA'S FIRST PLANT for the manufacture of liquid sulfur dioxide went into operation recently at Copper Cliff, Ont., as Canadian Industries Ltd. inaugurated production. The annual capacity is reported to be 90,000 tons, equal to the total production of liquid SO_2 in the rest of the free world. The cost is estimated to have been nearly $2,000,000.

Principal market will be the sulfite pulp mills in Ontario and Quebec. The 90,000 tons of liquid SO_2 is the equivalent of 45,000 tons of elemental sulfur. (Canada imports approximately 400,000 tons of sulfur annually, about 300,000 tons of which goes to the pulp and paper industry.)

The project is a joint undertaking of International Nickel Co. and C-I-L. C-I-L's Copper Cliff works has been producing sulfuric acid from Inco's smelter gases since 1930. Capacity was increased 60 per cent this year.

A process for making liquid SO_2 from dilute smelter gases was developed

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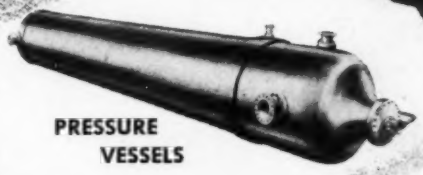

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by C-I-L in the 1930s. However, costs too high to compete with sulfur were encountered. And it was not until Inco developed a new flash-smelting process, which produced a gas containing 75 per cent or more sulfur dioxide, that it was found feasible to manufacture the liquid SO_2.

Cameron Machine Begins New Jersey Expansion

Cameron Machine Co. of Brooklyn, N. Y., has begun the erection of a new plant in Randolph Township, N. J., to supplement its present manufacturing facilities. The announcement of the project was made by Palmer J. Lathrop, president of the firm.

The new plant is to be a one-story structure with a total area of 42,000 square feet. There will be one high bay area equipped with 10-ton cranes to handle heavy machinery.

The building was designed to provide the company's growing need for manufacturing facilities for its line of slitting and roll winding machinery and to provide extended services to the paper, textile, rubber, and plastic industries. The plant is to house equipment for the machining operations for large components and also the assembly, finished stock, and shipping activities. It is anticipated that in excess of 100 persons will be employed at the new location. (The main executive offices and machining operations are to remain in Brooklyn.)

Allied Notes

Samuel M. Langston Co.,
Camden, N. J., has announced that it has completed the purchase of an adjoining property, comprising a one-story brick building with an area of 42,000 square feet and 48,000 square feet of land. The structure is to be used to increase production; some alterations will be necessary, following which new machine tools will be installed. Possession of the property will be taken sometime in 1953.

BIF Industries
has established a service center in Seattle that is equipped to handle Builders-Providence Inc. flow meters and controllers and Omega Machine Co. dry feeders. The territory covered by the Seattle office includes Oregon, Washington, western Idaho, British Columbia, and Alberta.

A. O. Smith Corp.,
Milwaukee, has announced the moving of its New England sales headquarters from Boston to Springfield,. Mass. The new office is headed by W. T. Halket.

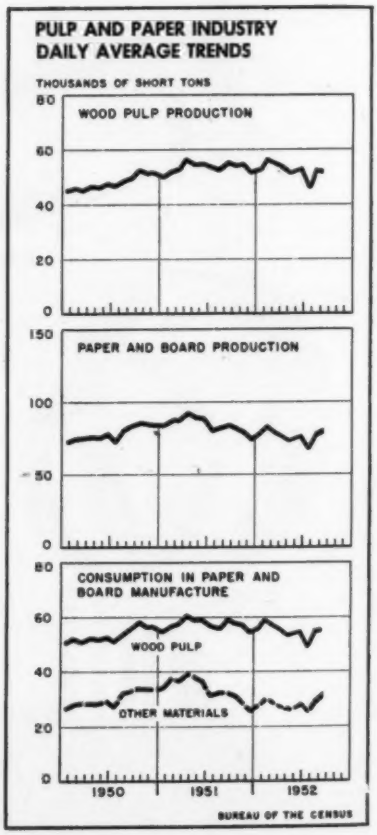
U. S. Paper and Paperboard Production

	Sept. 1952 (tons)	Aug. 1952 (tons)	Sept. 1951 (tons)	Total 1951* (1,000 tons)	Total 1946
Paper and Board, total	2,024,004	2,058,525	2,018,385	26,086	19,278
Paper, total	845,500	870,814	939,769	11,622	8,752
Newsprint	89,016	95,091	87,622	1,106	773
Groundwood paper (uncoated)	62,997	62,991	67,967	789	776
Printing and converting (coated)	80,794	88,462	88,645	1,115	486
Book paper (uncoated)	113,130	115,980	130,349	1,622	1,447
Fine paper (writing, cover and text, bristols, thin paper, and other)	100,268	100,213	110,546	1,364	1,160
Coarse paper (unbleached, kraft, glassine, greaseproof, vegetable parchment, and other)	245,086	256,307	296,966	3,597	2,690
Special industrial paper	32,216	31,884	32,496	419	272
Sanitary paper	94,675	92,701	96,587	1,215	861
Tissue paper	18,315	17,753	19,185	270	184
Absorbent paper	9,003	9,432	9,406	124	103
Paperboard, total	925,319	930,445	863,619	11,605	8,396
Containerboard, total	493,105	500,574	469,688	6,347	4,315
Liners	337,370	341,245	313,978	4,205	
Corrugating material	132,503	135,333	136,475	1,815	
Container chip	23,232	23,996	19,235	328	
Bending board (folding boxboard)	270,227	271,238	243,291	2,429	2,317
Non-bending board (set-up boxboard)	70,099	71,007	62,275	701	521
Cardboard	6,074	5,885	6,804	79	89
All other paperboard	85,814	81,741	81,561	2,049	1,154†
Wet machine board	12,104	11,442	10,185	144	138
Construction paper and board, total	241,081	245,824	204,812	2,716	1,992
Building paper and insulation	123,366	119,381	103,257	1,401	1,036
Hardboard and insulation board	117,715	126,443	101,555	1,315	956

(*) Preliminary report. (†) Includes bending board and non-bending board not for use in box plants. *Source: U. S. Department of Commerce.*

September Pulp, Paper and Board Production

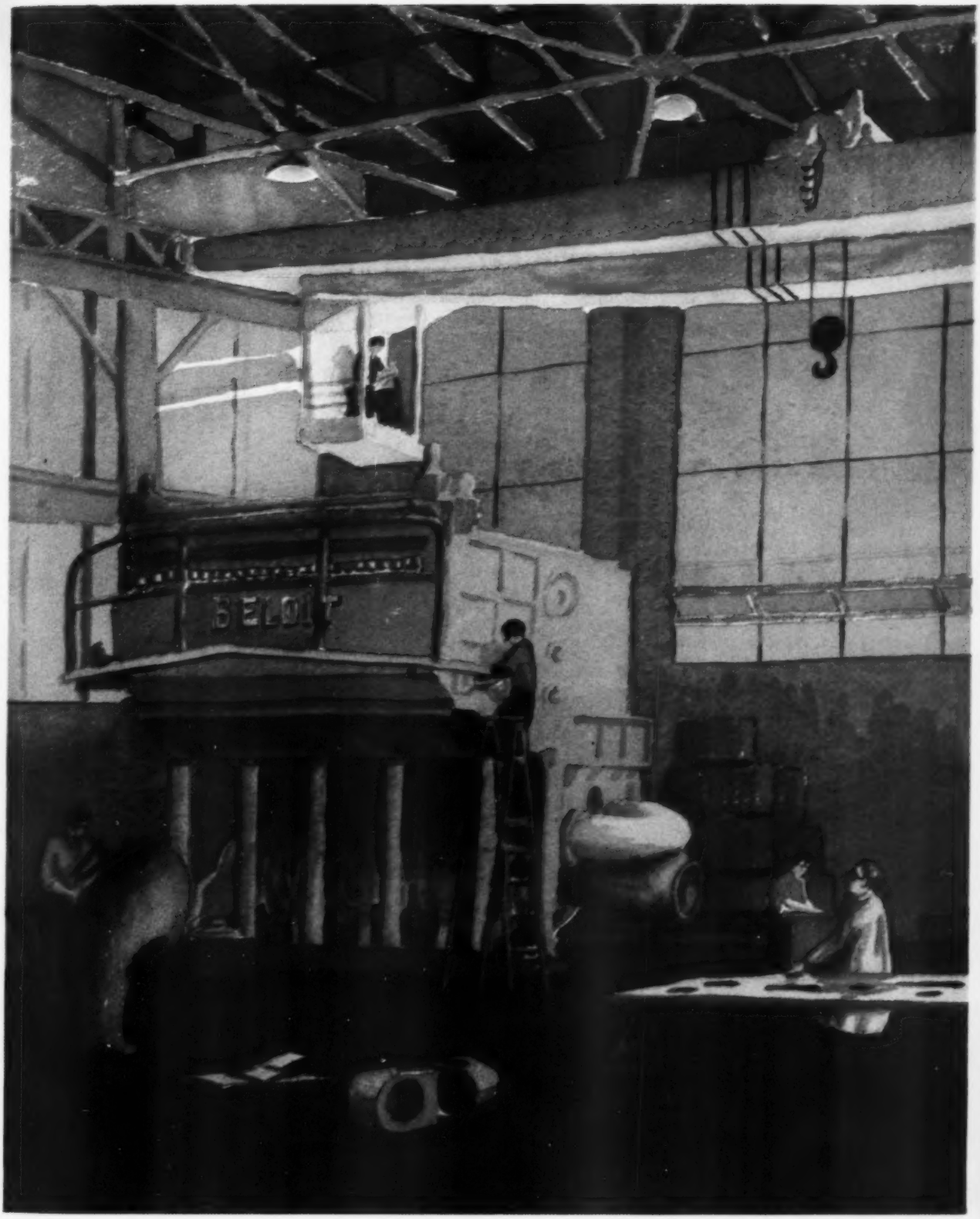
Paper and board production during September amounted to 2,024,004 tons, according to a report released by the Bureau of the Census. This is a slight increase over the 2,018,385 produced in the same month a year ago. In terms of production base capacity, the industry operated at 75.2 per cent in September, with the paper and paperboard sections operating at 75.7 and 73.4 per cent, respectively. The comparable ratios for August were: Total, 73.7 per cent; paper, 75 per cent, and paperboard, 71.1 per cent.



Pulpwood receipts at the pulp mills during September were 2,348,718 cords, with consumption at 2,105,466 cords. Month-end inventories increased about 4 per cent to 5,998,991 cords.

Wood pulp production during the month amounted to 1,317,229 tons. In terms of production base capacity, pulp production ran at 79.8 per cent, as compared to 80 per cent in August.

Wood pulp inventories at the end of September at the paper and board mills were 518,522 tons, as compared to 528,431 tons reported at the end of August. Month-end stocks at the pulp mills decreased about 4 per cent to 135,031 tons.



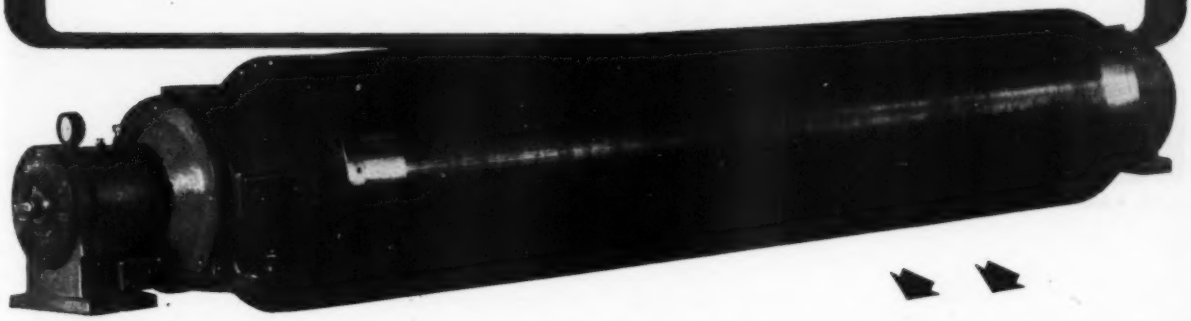
WATER COLOR PAINTING BY L. J. A. MEESE

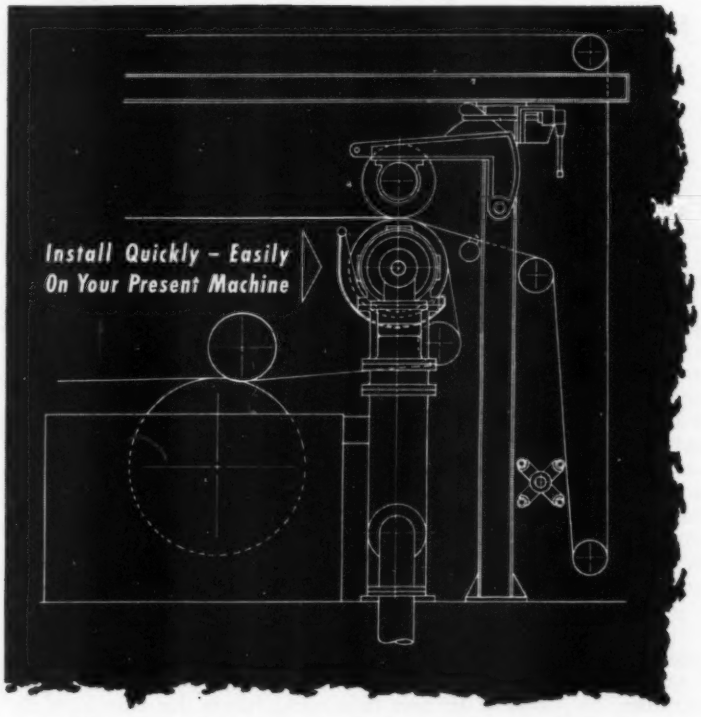
BELOIT IRON WORKS PAPER MACHINERY BELOIT, WIS., U.S.A.

NEW ERECTION FLOOR at Beloit Iron Works provides additional floor space, high ceiling and heavy-duty cranes needed for erection and checking of Air-cushioned Inlets, Fourdriniers, press framing, dryer framework, supercalenders, and winders for high-speed, high-production paper machines.

YOU'LL SAY SO, TOO — WHEN YOU INSTALL

A MANCHESTER SUCTION DRUM ROLL





Schematic drawing of an actual application of a Manchester Suction Drum Roll on a board machine. Note how simple and economical it is to install.

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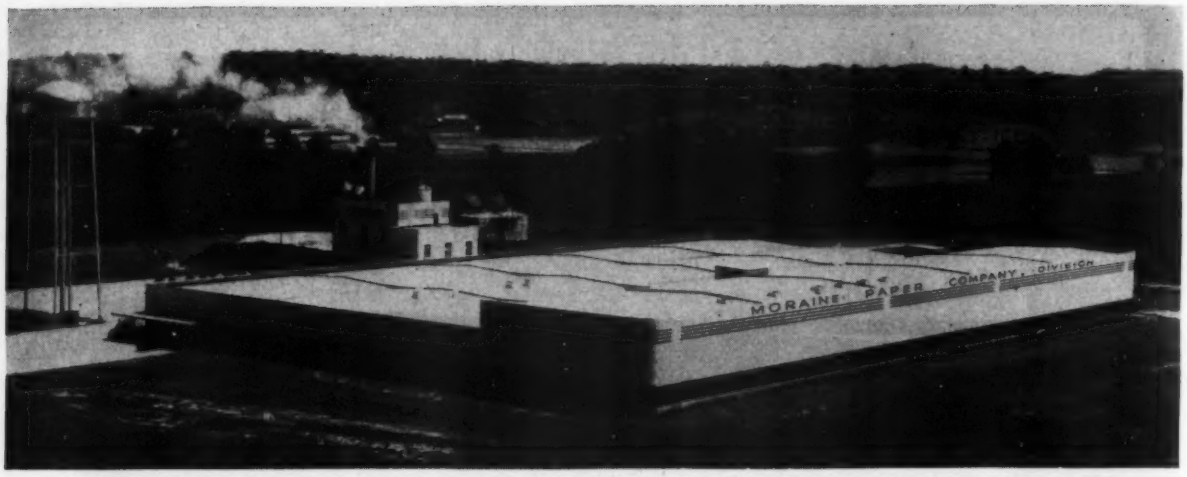


Aerial view of Moraine mill. Manufacturing and architectural designs by Frederic C. Clark and Ray W. Yount, respectively

Moraine—America's most modern fine-paper mill

A. W. J. DYCK

One of the world's most modern and efficient fine-paper mills, and the first completely new fine-paper mill built in North America during the last 25 years, has been in operation for several years at West Carrollton, Ohio. Known as the Moraine Division of the American Envelope Company, the mill is laid out on a straight-flow operational design. Moreover, the mill is so designed that additions can be made in all directions without impairing production efficiency or interfering with the straight flow of operations from raw materials to finished products.

The Moraine Division is a natural outgrowth of the ever-expanding parent company established in 1895. In 1906 this company acquired the Miamisburg Paper Company which has been in existence since 1871. In 1934 a branch envelope factory was organized in Chicago under the name of the Karolton Envelope Company.

By 1945, the Miamisburg mill could no longer meet the requirements of the two envelope factories, and it was decided that an entirely new, modern mill should be built with the capacity of more than twice that of the Miamisburg mill. Construction of the Moraine mill began in 1946, and in May, 1948, the first paper was made by the new machine.

In the words of Carl Magnus, dynamic superintendent of the Moraine mill, "the common-sense, straight flowsheet design of the mill, the adoption of the most advanced paper-making techniques, and the installation of the most modern equipment have given this mill a very low man-hour usage per ton of paper output."

The mill's current daily output is 90 tons of fine paper, the major types of which include envelope paper, offset paper, sulfite ledger, index bristol, and cream postcard stock. The mill employs 200 workers. Managing and superintending officers are: Carlton W. Smith, president; Horace C. Tracy, vice-president and sales manager; R. T. Bertschy, secretary; Harley L. Werth, assistant-secretary; Carl Magnus, superintendent; William H. Hipshire, plant engineer; Victor Casper, maintenance supervisor; William C. Martin, chemist; Robert Knowles, paper machine supervisor; and Charles Piper, supervisor of stock preparation.

Constructed of a warm buff brick and lined with glazed tile inside, the completely windowless 300 x 500 foot structure looks expensive. In fact, the cost of construction materials used exceeds that of conventional construction materials by about $30,000. But, quite apart from the fact that this artistic and functional design conforms with the tastes of the company's president, Carlton W. Smith, it is already evident that this choice of construction materials has considerable economical merit, for maintenance costs are practically non-existent.

How was Moraine's high output efficiency accomplished?

Among the main contributing factors that have given the company this advantage of low man-hour usage and high production efficiency, the following may be listed:

(1) The functional straight flow operational design. The entire main floor is at railroad cardoor level. The raw materials, unloaded at one end, are converted to finished products while moving in chain fashion through the L-shaped one-story mill.

(2) There are no beaters in the mill. The refining is done entirely by hydrafiners and jordans. The jordans are housed in a sound proof separate room constructed of acoustical wall and ceiling material.

(3) All stock preparation facilities, equipped with motor operated valves, are controlled from a single Shartle Brothers console panel.

Moraine Laboratory; door at the rear leads to modern, well-equipped paper testing room

Stock Preparation room, with Hydrapulper, console control panel, color room, and machine chest

(4) Offices, laboratory, and machine shops are centrally located for easy access.

(5) All offices, laboratory, locker rooms, conference rooms, and finishing room are air-conditioned. The machine room is equipped with a controlled ventilation system, air being forced into it by Ross fans and exhausted through the Ross hood.

(6) Bright fluorescent lighting is used throughout the mill. In the finishing room, a unique lighting system developed by Moraine engineers permits each worker to adjust his own light at any required height by pulling it down vertically from the ceiling.

(7) Automatic doors, operating on the electric eye principle, connect the finishing and the stock storage rooms.

(8) A specially constructed turn-table in the finishing room consisting of two back stands, each of which is equipped to hold 12 rolls, saves about 50 per cent of the time normally required for sheeting paper. When one back stand is empty, it requires only a push of a button to bring the filled second back stand in line with the Hamblet cutter. This turn-table, the first of its kind in the world, was designed by Moraine engineers. The company has recently licensed Black-Clawson-Dilts to build it for sale to the trade.

(9) A 15-ton overhead crane, built by Northern Engineering Works of Detroit, spans the full width and can travel the whole length of the machine and stock preparation room.

Current expansions, as disclosed by Mr. Magnus, include the installation of a second turn-table to supply the recently installed Clark-Aiken cutter. A complete mechanization of trimming operations is also under way, as well as various expansions of pulping facilities.

Stock preparation

Virgin wood pulp—the main constituent of Moraine paper grades—consisting of bleached sulfite, craft, sulfate, soda, and hardwood pulps is defibered in a 16-foot Shartles Hydrapulper, and then refined in Hydrafiners, and two jordans.

Some de-inked pulp, prepared in the 25-ton capacity de-inking plant, is also used. The raw material, consisting exclusively of choice-quality waste paper, is defibered in an 11-foot Shartle Hydrapulper.

After de-inking, the stock is refined in a Bird-Jonsson screen, a Shartle Hydrafuge, four Bird Dirtex refiners, two Impco washers, one Nekoosa washer, and two Moraine washers.

Starch mixtures, rosin emulsions, glue mixtures, and bleaching solutions are prepared in a separate room. An ingenious signal system that records the level of the starch mixture in the two starch tanks was developed by W. C. Martin, Moraine's chemical engineer. A Hercules Powder Company rosin-emulsifier is used for the preparation of rosin emulsions.

Sizing materials and dyes are added to the refined pulp in glazed tile-lined cycling chests built by Stebbins Engineering and Manufacturing Company which has also installed all stock preparation chests.

The Sveen glue system for flocculation in the Sveen-Pederson saveall has been adopted by the company.

Paper machine

The machine has a 128-inch wire, trims at 120 inches, and is designed for an output of 1,000 feet of sheet per minute.

The fourdrinier is equipped with seven oscillating suction boxes. The first of three presses is a vacuum press. There

Carl Magnus
Superintendent

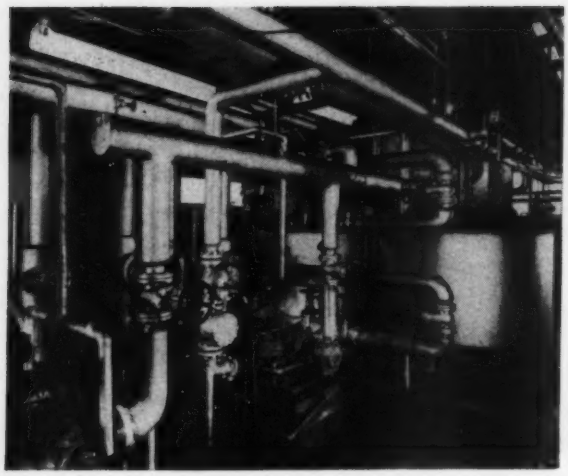
William C. Martin
Chief Chemist

Victor E. Casper
Maintenance Sup.

Robert Knowles
Paper Machine Sup.

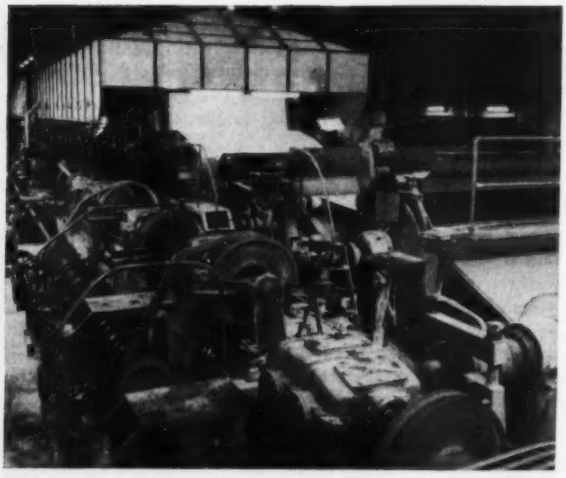
Charles Piper
Stock Prep. Sup.

William Hipshire
Plant Engineer

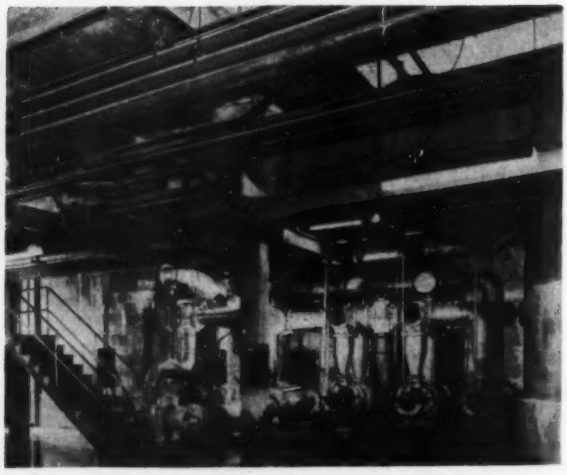


Cochrane Corporation water softener and heater for make-up water

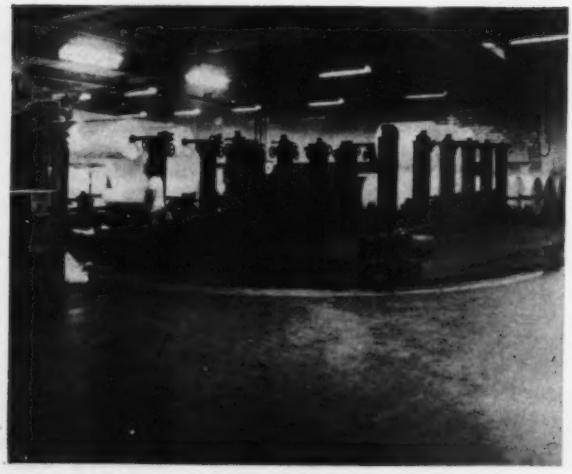
Babcock & Wilcox boiler, Westinghouse stoker, and Westinghouse turbine in power plant



Paper machine with Sandy Hill mechanized drive powered by Westinghouse turbine



Hydrafiner and stock distribution system



Dual backstand servicing cutter in finishing room. Up to 12 rolls can be sheeted at one time

Air conditioned finishing room

are 56 dryers, arranged in 4-section units and equipped with anti-friction bearings. A Foxboro panel records the moisture content of the sheet.

The 10-roll calender stack, also featuring anti-friction bearings, was built by Black-Clawson Company. The calender stack is further equipped with a Mason-Neilan Regulator Co. Exact-a-Load which pneumatically controls and adjusts pressure on both sides of the rolls.

The winder was built by Cameron Machine Co.

Finishing room

A Surface Combustion Corp. Kathabar air conditioning unit controls the humidity and temperature conditions in the finishing room which, as already stated, houses an ingenious Moraine-made turn-table and the two Hamblet and Clark-Aiken cutters.

Other equipment in the finishing room includes a Seybold-60 trimmer and a Seybold Precision trimmer. Both have been equipped by Moraine engineers with air flow jets to facilitate the handling of paper stacks.

Power plant

The coal-fired Babcock & Wilcox Co. boiler, equipped with Westinghouse stoker, has a capacity of 70,000 pounds steam per hour, 425 pounds working pressure, and operates at 625 F. total temperature.

An extraction-type Westinghouse turbine has a generating capacity of 3,750 kva.

There are two feed-water pumps made by Goulds Pumps Inc. rated at 1,286-foot head and delivering 87,000 pounds of make-up water per hour. These are driven by individual steam turbines at 3,550 rpm. A Westinghouse condenser, with a condensing surface area of 2,500 square feet, is served by two 1,700-g.p.m. circulating pumps.

Other equipment at the Moraine mill includes: (1) Midwest Fulton condensing system, (2) a mechanical drive powered by a Westinghouse turbine, (3) a Monorail conveying system, (4) a Robbin-Myers hoist, (5) Fairbanks-Morse scales, (6) Webster coal handling equipment, (7) United Conveyor Company ash and fly ash conveyor, (8) a Cochrane Corporation water softener and heater, (9) Lilie-Huffman cooling tower, and (10) Nash vacuum pumps.

Utilization of sulfite pulp mill wastes . . . and their markets

S. R. P. ANNETT and W. E. STOBO
Lignosol Chemicals Ltd.

IN THE ACID SULFITE PROCESS, which dissolves out the lignin, wood sugars, and other soluble substances, about 50 per cent of the wood on a dry weight basis goes into solution in the cooking liquor. Normally, the spent liquor is run down the drain at the end of the cooking process. In this way millions of tons of chemical raw materials are wasted every year.

A case history of how a market was developed for the lignosols recovered from Gaspesia Sulphite Co. Ltd.'s sulfite pulp mill wastes.

Recovery of the solids from the spent liquor would probably be universal, were it not for two difficulties: (1) the presence of calcium sulfate and (2) the large proportion of water. The former readily scales the heating surfaces of any evaporator and prevents efficient heat transfer. The latter requires not only low cost steam, but also the efficient use of it. The absence of any single large scale use for spent sulfite liquor is not altogether an obstacle, but it means that a number of smaller applications must be found for it. It also means that the product must be modified to meet the requirements of the industry to which it is supplied.

Apart from this company's activities,

Presented at the Mont Tremblant meeting of the Chemical Market Research Association.

two plants in Canada make yeast from the sugars in spent sulfite liquor. Two others make alcohol and two make vanillin. One mill produces powdered calcium lignosulfonate. Seven firms in the United States, four in Sweden, two in Norway and three in Germany produce concentrated or powdered spent sulfite liquor. Of these, only one is actively promoting a variety of modifications.

One group of firms on the West Coast of the United States is studying ammonium bisulfite cooking liquors, with the intention of burning the lignin and recovering heat and chemicals. In Canada, Howard Smith Paper Mills Co., Ltd., is investigating magnesium bisulfite cooks with the same end in view. In a way, these are defensive moves, for injunctions are out against stream pollution with pulp mill wastes. Spent sulfite liquor is particularly bad because it has a high biological oxygen demand.

In the Scandinavian countries the alcohol derived from the fermentation of the sugars in spent sulfite liquor is used as a motor fuel. It is also the base of a sizeable chemical industry. We are indebted to Scandinavian researchers for much basic information about the nature of lignin itself and also about lignin sulfonic acids.

The possibilities of low cost vanillin are intriguing. If the selling price can be reduced to 40-60 cents per pound, that is, within the range of cost of chemical intermediates, a large market is predicted for it. The recent announcement of plans for a new vanillin plant by Ontario Paper Co. indicates that progress is being made in this direction.

The use of lignin derived from alkaline pulping processes in rubber as a reinforcing material also promises a great market. The problem at the moment is co-precipitation. Like lignin sulfonic acids, this type lignin is a good dispersing agent.

The story of Lignosol . . .

The story of lignosol started in 1943 at Chandler, Quebec, where a pilot plant was built adjacent to the pulp mill belonging to Gaspesia Sulphite Company Ltd.

The plant consisted of a single open tank in which spent liquor from the sulfite pulp digesters was concentrated by boiling. When the solids content reached 50 per cent by weight, it was transferred to drums on tank cars. Study of more efficient methods of evaporation was deferred until the market for this product had been explored.

There were at this time a number of established applications for concentrated spent sulfite liquor. It was used as a binder for refractory brick, to increase the green and dry strength of ceramic products, as a foundry core binder, as an ingredient of linoleum cement, and as a stabilizer and binder for highways —applied prior to paving.

Lignosol B, as the new product was named, was first sold to the Quebec Roads Department for use on highways around the Gaspé Peninsula. The method of application improved with practice, and the economy of its use was eventually demonstrated. Over 600 miles of highway have now been treated with this product.

This development was followed by sales to manufacturers of refractory and ceramic products, to foundries, to firms producing linoleum cement. In 1944 the first modified form of lignosol was produced. This was Lignosol T, commonly known as spruce extract, and used extensively by the tanning industry.

About this time the organization acquired a sales force of one, which gave the development a new slant. For one thing, the laboratory began to receive much more information about the customers' needs and about possible uses. The first and best result of this cooperative effort was Lignosol SF, a cement dispersant which is now our most important product.

Meanwhile the pilot plant expanded to keep pace with sales until it became a production unit. In 1948 it became evident that the time had come to rebuild and reorganize. In rebuilding, it was essential to incorporate the most modern equipment. Most of it had to be evaluated on a small scale first. A model thermal compression evaporator was built at Chandler, its operation studied, and its design altered until it was adapted to meet the requirements of evaporation of spent sulfite liquor. The use of this type of equipment ensures the most economical use of steam. The scaling problem was also brought under control and finally, in 1949, design of the new plant to be built in Quebec was begun.

Adaptation of the thermal compression evaporator for use with spent sulfite liquor and virtual elimination of scale were highly original achievements. The paper given at the 1950 meeting of the Technical Section of the Canadian Pulp and Paper Association in which the results were reported, won for its authors the Weldon Medal, awarded annually for the best research of the preceding year.

Except for the design of the evaporator, which was drawn up by E. B. Badger & Sons, the general engineering department of the parent companies performed the services of both engineer and architect. The first orders were placed late in 1949. However, the problems of shortages intervened, and it was not until 1951 that construction started and not until 1952 that the equipment was delivered and installed. All through these delays the plant at Chandler struggled to keep up with the growth of the business. The new plant at Quebec has a capacity of approximately 22,000 tons a year, which is three times that of the older installation.

In the beginning the lignosol development had no separate management. This, however, was soon found necessary, and from 1945 to 1951 the plant operated as a division. In 1951 it became Lignosol Chemicals Ltd., financed jointly by Anglo-Canadian Pulp and Paper Mills Ltd. of Quebec City and Anglo-Newfoundland Development Co. Ltd. of Grand Falls, Newfoundland. In addition to the plant, the new company maintains offices and a research laboratory in Quebec City.

Market development

At this stage the search for markets is qualitative rather than quantitative. Over the next few years attempts will be made to establish as many new applications and as many new products and processes as possible without too much attention to the exact size of the market. There are of course certain minimums. While no application for existing products is too small to receive attention, the company will not install equipment to make a new product that does not offer as much return as the products currently made.

In the search for new applications we are guided more by the tonnage of a process than by the value of its product. Any industry that processes a large tonnage of materials is considered a prospect. Given a large industry, we next check the bibliography for such information as exists. Following that, we study a basic text, omitting sections of no significance. Finally, we see the people who know the product. This includes professors in universities and technical schools, research workers in the related departments in government laboratories, as well as a number of the plants themselves. This last step is almost always most profitable. The texts are never quite up to date. The statistics give us size and no more. Sometimes the person we see becomes curious and starts his own investigation. At the very least, a few such calls will either eliminate the prospective application or indicate some one test which will determine its feasibility.

For example, in the course of a round of visits in Ottawa, we dropped in to visit the metallurgical laboratory in the Department of Mines and Technical Resources to discuss foundry core binders. The most important property of a core binder is the tensile strength it produces in a core after baking. The laboratory undertook to measure this one property in a series of lignosol products.

It was found that the dry tensile strength produced by ammonium lignosulfonate and by sodium lignosulfonate is as much as five times that produced by calcium lignosulfonate, a product which has been used as a foundry core binder for a number of years. We expect this information will enable us to double the use of our products by foundries. It will also enable us to export to those countries where our competitive product is calcium lignosulfonate.

The next stage is industrial evaluation and, following that, an investigation of other properties relating to the specific application and preparation of a bulletin. Finally the sale is turned over to an agent.

Perhaps the most interesting feature of this specific development, and others like it, is that we had no strict scientific basis for expecting the results to be what they were. It was speculation, qualified perhaps by our general knowledge of our products and by scraps of related information, that prompted us to promote the tests. It could hardly have been otherwise. The chemical nature of lignin itself is still in question, and what it becomes after being cooked out of the wood is still more obscure.

Speculations often go wrong too. For instance, we reasoned that, since calcium lignosulfonate is a useful binder for foundry cores and for briquettes, it would also make a good binder for fertilizer pellets. It did not. If anything, it made the pellet formation more difficult. However, that trial preceded the work on foundry cores with ammonium and sodium lignosulfonates, and we now speculate that one of these materials may behave differently.

Suggested lignosol uses

Since we are obliged to guess, we can at least guess systematically, taking one industry at a time. Here are some of the possibilities under consideration.

In Agriculture: We already know that calcium lignosulfonate is a good dispersing agent. We expect to find that both sodium and ammonium lignosulfonates will be better and will be suitable for use in wettable powder fungicides, insecticides, and herbicides.

We intend to try ammonium lignosulfonate for pelleting fertilizer.

The Science Service section of the Department of Agriculture has found that calcium lignosulfonate improves the agglomeration of soils. Other investigators have found that ammonium lignosulfonate is useful as a fertilizer and that the sugars have a beneficial effect on desirable soil bacteria. It does not seem to have any toxic effects. No practical use has been made of these observations, for, although some agglomeration is obtained, it takes a large amount of calcium lignosulfonate to produce it; the value of ammonium lignosulfonate as a fertilizer is much less than that of inorganic nitrogen salts; the effect on soil bacteria works two ways: if they are stimulated too much, they rob the plants of available nitrogen. We are looking for someone who wants to grow a crop to which soil drainage and soil bacteria are important on a piece of land where agglomeration is nil. If we provide no economy there we give up.

In the food processing industries, some use may be made of the fact that lignin sulfonic acid precipitates proteins. For instance, it might be possible to make better recovery of packing house wastes.

In Mining: Starting from the known fact that small amounts of lignosulfonates reduce the viscosity of slurries of almost anything, we speculated that they would also increase grinding efficiency. We have found that in some cases this is so, although according to some texts this was not to be expected. Whatever the reason, there is a useful effect and, because of the large tonnages handled by the mining industry, we have launched an investigation of all possible applications. This work is being done at Laval University.

In Construction: The use of lignosol in road building, in cement, and in clay products was mentioned earlier. In addition, we now have good experimental evidence to show that calcium lignosulfonate will prevent frost heaves. Field application of this discovery is in progress. Credit for this development is due to Dean Hardy of the University of Alberta, who did the fundamental work.

The reason for the improvement of the heaving strength of roads and for the elimination of frost heaving is somewhat obscure. We speculate that both are due to an increase in density of the soil and that this in turn is due to the dispersing action of lignin sulfonates, whereby all interstices are plugged with fines. At the Massachusetts Institute of Technology this summer, it was shown that dispersing agents have just this effect. Soils treated with them show high density and low permeability to moisture. We plan to have the experiments repeated at L'Ecole Polytechnique this fall and winter. If it develops that this increase in density is indeed the governing factor, then we have a case for a permanent effect with an agent that is undoubtedly leached away.

We propose to proceed from this point—if we are right about the density effect—to the field of soil compaction, which is a large one.

Another new development, a discovery by Smith and Hough, promises to be important in the construction field. They have found that solutions of calcium lignosulfonate treated with bichromate will gel and become water resistant. This will be useful in grouting. For instance, in the construction of dams or levees it is important to prevent loss of water through permeable strata of sand or silt. Chrome lignin grouting could prevent this. Once again this is a large field.

The development of the market for calcium lignosulfonate in the clay products industry shows how useful government publications can be. The publication "Manufacturers of Clay Products in Canada" gives the names and addresses of all the plants, the names of the managers and superintendents, the raw materials used, the process and equipment, the products produced, capacity and the number of months in operation. However, it still takes a call on each firm to determine whether our product might be useful, and a test to prove it. Some natural clays have good dry strength and need no binder. We have gone through the whole drill with this industry and sales are now in the hands of an agent.

In Adhesives: Use of calcium lignosulfonate in linoleum cement is an old application. This company meets strong American competition in this market. However, we have some grounds for believing that the sodium or ammonium lignosulfonates will prove more efficient and will give us a preferred position.

Lignosol A, which is a formulated product, has proved a satisfactory substitute for animal glue in the manufacture of gummed tapes.

Dispersants: The most interesting market for dispersants is in the master batch process for cold rubber, where carbon black is added to the latex as a dispersion. We have some hopes of entering this field. No doubt the same product will prove useful in other applications, such as dyeing and cleaning.

Calcium lignosulfonates are also used as dispersants in oil well drilling muds, where the drilling encounters anhydrite strata as in western Canada.

Export

The Foreign Trade Division of the Department of Trade and Commerce has been most helpful. They have given us data on tariffs, exchange, import regulations and competition. They have supplied us with agents and have helped us with our arrangements with them. Groundwork is being laid for the day when trade restrictions ease.

Actually we now export some 40 per cent of our production, mostly to the United States. Although the 7 per cent tariff into that country is admittedly low, tariff on the American product coming into Canada is nil. What we would like in our line is free trade both ways.

Paper-honeycomb cores for structural sandwich panels . . .

—a potential outlet for resin manufacturer's products

ROBERT J. SEIDEL
Chemical Engineer
Forest Products Laboratory

BONDING OF paper honeycomb cores between thin and strong facing sheets results in sandwich panels that are becoming increasingly important for structural applications. The panels are strong, stiff, and light. They can be made by processes that lend themselves to mass production, from materials that are produced in large volume.

Pulp and paper mills, in an endeavor to diversify their products, consider the sandwich panel as an additional long-term outlet for paper. Resin manufacturers too are interested in the sandwich panels since they provide a promising use for their products in core impregnation and in plastic sandwich facings.

Plywood, veneer, and boxboard producers are following this development closely. Metal companies are intrigued with the feasibility of using metal as facing material.

What are sandwich panels?

A sandwich panel consists of an appreciably thick core of a low density material bonded on each side to a thin sheet of strong, stiff material. A great variety of facing materials, such as wood, hardboard, asbestos board, aluminum, and plastic laminates, has been bonded to many lightweight materials such as balsa wood, rubber, plastic foams, and sheets of cloth, metal, or paper.

When careful consideration was given to economics, availability, and other properties, it became increasingly clear that paper would play an important part in the large-scale development of honeycomb. In fact, paper is almost the only material apparent at present for the possible, large-scale development of high strength honeycomb panels.

The problem of making honeycomb cores from paper is essentially one of "blowing up" a certain volume of a dense paper to yield a much larger volume of a low-density cellular structure. After the spacing between sandwich facings has been determined by design, honeycomb is made to fill the entire volume between the facings. The density of core is one of the key factors in the economy of structural sandwich panels, as the materials are relatively costly on a weight basis and must be made to provide the greatest possible volume consistent with desirable properties.

Abridged from Report No. R1918, Forest Products Laboratory, Madison, Wis.

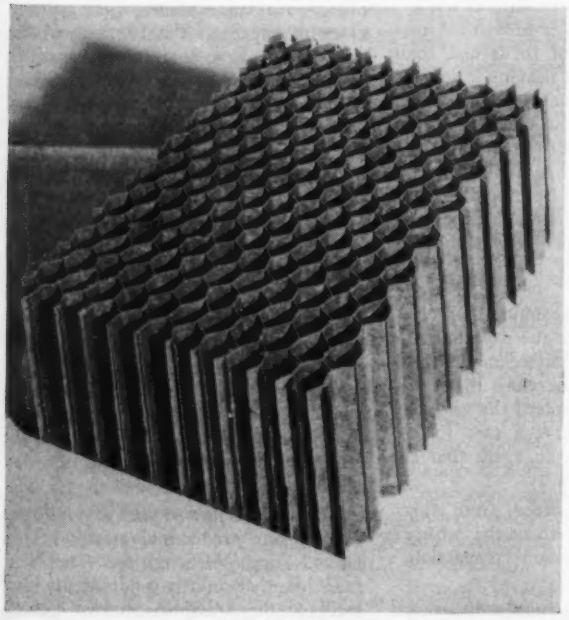


Fig. 1—Expanded type core consisting of sheets of paper interspaced with parallel strips of adhesives

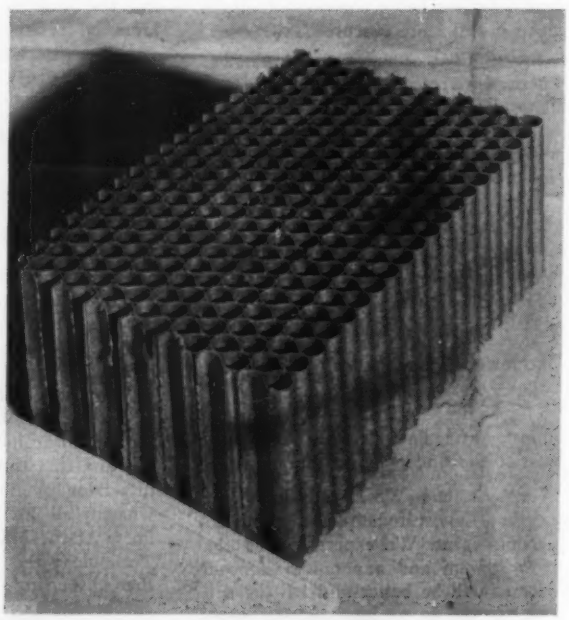


Fig. 2—Looped or figure-8 type core consisting of sheets of paper looped and bonded to form circular cells

Core types

Paper can be "blown up" in volume to produce core in numerous ways. Three of the more prominent types used for sandwich panels are the "expanded," "figure-8," and "corrugated" cores. In the expanded type, sheets of treated paper are laid up and interspaced with parallel and uniformly space strips of adhesive. Successive strips of adhesive are placed so that the centers of any one layer are positioned at mid-point between strips of the preceding and the succeeding layer. The blanks after bonding are expanded to form hexagonal cell sections, as shown in Fig. 1.

To produce the figure-8 core, a ribbon of paper is looped and bonded to form circular cells resembling the figure 8 in cross section, as shown in Fig. 2. Special machines are required for the production of either the figure-8 type or the expanded type cores.

In the production of the corrugated type of honeycomb, the cell or flute is made by hot forming paper between fluted rolls on equipment of the type used in making corrugated container board. The corrugated sheets, with or without uncorrugated interleaving sheets, can be assembled in many ways. The three corrugated types discussed in this report are shown in Figs. 3, 4 and 5.

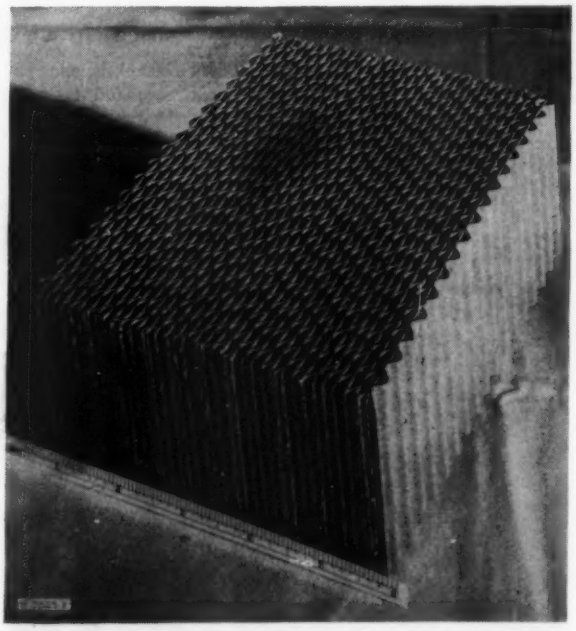


Fig. 3—Corrugated core known as PNL consisting of parallel sheets separated by treated uncorrugated sheet

Each type of core has advantages and disadvantages peculiar to its construction. The differences lie in equipment needed for production, limitations in resins and adhesives, the relative difficulty of accurate cutting, strength, thermal insulating properties, ease of shipment, and other factors.

Base paper

The results at Forest Products Laboratory showed that sandwich panels with surprisingly high strength properties could be made from unsized neutral kraft paper weighing only 30 lb. per 3,000 sq. ft. and yielding a core of a density of about 2.5 lb. per cubic foot.

No information so far is available on the minimum strength requirements of the base sheet for satisfactory core structures. The relation between ordinary properties of paper and the properties of cores is still obscure. Until the requirements of paper for use in cores can be better defined, it is impossible to determine the best papers for any particular use. At present, it is safe to assume that any of the ordinary chemical pulps are suitable. In applications where maximum permanence is not essential, a high-yield or semichemical pulp may be acceptable or even preferable for structural uses. Reclaimed paper may also provide a suitable fiber for certain panels. Although little is known of the permanence of semichemical pulps in sandwich panels, permanence for this application may not be a critical factor, since the core material in the sandwich panel

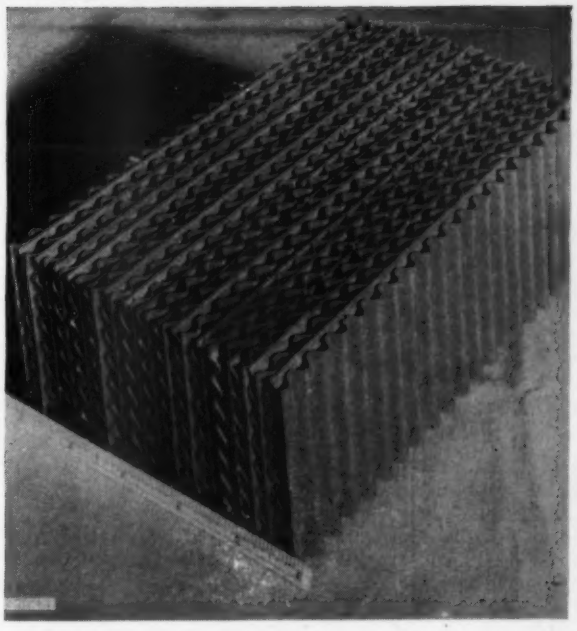


Fig. 4—Corrugated type XN consisting of sheets with main flute directions of adjacent sheets at right angles

is protected from ultraviolet rays, which to a large extent are responsible for the loss of paper-strength during aging.

Resin-treated paper

Resin treatment of paper is one of the first problems to be considered in paper core manufacturing. Since panels are likely to be subjected to damp or wet conditions, the presence of resin in the paper is necessary to yield a product that is permanently strong and stiff under wet conditions. Resin-impregnated papers have been shown to retain 75 per cent of their dry strength after water soaking. Such a treatment would cause untreated paper to lose almost all its sterngh. Two types of phenol formaldehyde resins, the water-soluble and the alcohol-soluble types were used at the Forest Products Laboratory. With solutions of water-soluble resins, the swelling effect of water on the fiber permits the resin to penetrate the fiber itself and, through bulking effect, maintain the fiber in the swollen state. When alcohol-soluble resin is applied in the absence of a swelling solvent, the effect appears to be chiefly one of coating the fibers.

As evidence that water-soluble resin penetrates the fiber better than does alcohol-soluble resin is the reduction in the equilibrium moisture content of the sheet with water vapor in the case of the water-soluble resin-impregnated papers, and the results of decay tests which showed that the water-soluble resin-impregnated papers had considerably greater decay resistance.

A resin treatment with 15 per cent water-soluble resin was found to be adequate for providing papers of good strength when wet, decay resistance, and handling characteristics during corrugation and subsequent fabrication. The resin content in excess of 15 per cent does not seem to produce a gain in strength commensurate with the increased quantity of resin used. In one series of tests, paper containing as little as 5 per cent water-soluble resin was satisfactory in strength but showed less resistance to decay organisms than paper with 15 per cent resin.

Resin impregnation can be done on a separate impregnating machine—which may be a somewhat costly process since it involves a secondary operation, or the resin may be applied during the process of papermaking. The latter is the

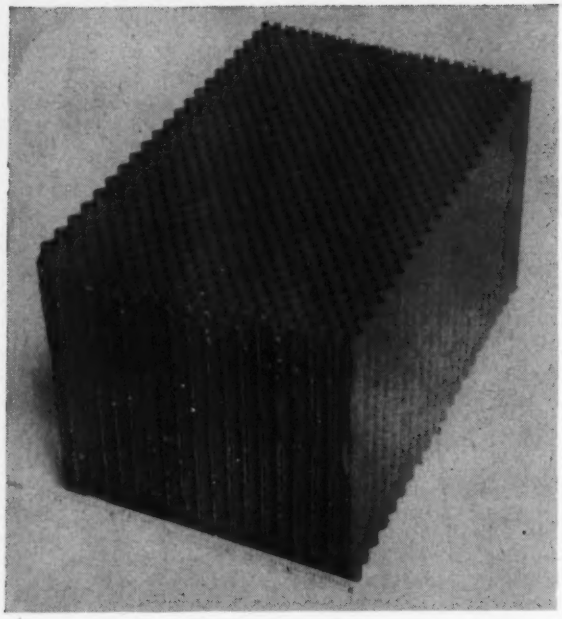


Fig. 5—Corrugated type PN consisting of sheets assembled parallel to each other and bonded at the crests

more economical way. It is possible to add resins during paper manufacture by (1) applying it at the paper machine size press or similar device, (2) blending of fiber and resin in water suspension in the beater and retaining this resin in the sheet during papermaking, and (3) continuous addition of liquid resin at the machine head box.

In recent years, suitable resins have been developed for addition to both the beater and the paper machine head box.

Facings

Any honeycomb core is satisfactory only in relation to the facings it supports and, conversely, the suitability of any facing may depend on the core. Perhaps one of the best long-term advantages of the sandwich panel is the great latitude it provides in choice of facings and the opportunity to use thin sheet materials. The sheet materials include plywood or single veneers which are overlaid with resin-treated paper; hardboards; asbestos board; metals, such as aluminum, enamel steel, stainless steel, or magnesium sheet; wallboards; fiber reinforced plastics or laminates, and veneer bonded to metal.

Table I—Stiffness and strength of structural sandwich panels on a 96-inch span

Facings	Panel thickness	Center deflection[a]	Span-deflection ratio[b]	Maximum uniform load	Approximate bowing deflection[c]
	In.	In.		Lb. per sq. ft.	In.
¼-inch Douglas-fir plywood	3	0.184	521	300	0.38
	2	.453	212	192	.58
	1	2.390	40	82	1.15
Two 1/10-inch Douglas-fir veneers with paper overlay	3	.207	464	268	.....
	2	.483	199	175	.....
	1	2.140	45	85	.....
One ⅛-inch Douglas-fir veneer with paper overlay on each side	3	.169	568	332	.....
	2	.396	242	216	.....
	1	1.810	53	101	.....
¼-inch tempered hardboard	3	.202	475	344	1.00
	2	.498	193	218	1.50
	1	2.630	36	94	3.00
⅛-inch tempered hardboard	3	.313	306	269	.....
	2	.735	130	176	.....
	1	3.350	29	82	.....

(a) All cores of the cross-corrugated XN type were made from 50-pound paper treated with 15 percent of resin. The core density was 2.5 pounds per cubic foot.
(b) Deflection under a uniform load of 20 pounds per square foot on a span of 96 inches.
(c) Midspan deflection computed from the differential expansion of the two facings obtained by exposure of one facing to a relative humidity of 97 percent, the other to a relative humidity of 30 percent for 30 days.

Plywood is a versatile facing material, and the performance of panels with such facings can now be well predicted. It has good dimensional stability characteristics and strength properties. It can be dependably bonded to the core with proven adhesives. When exposed to outdoor conditions, some plywoods, such as Douglas fir, may check considerably and grain raising may become apparent. These defects may be eliminated by applying resin-treated paper-overlay sheet to the outer face of the panel.

Pressing

Satisfactory performance of the sandwich panel depends to a great extent on the bond between the core and facings. In fact, the development of sandwich panels was made possible by the introduction of high quality adhesives. Adhesives that produced satisfactory bonds included: (1) an acid-catalyzed, high-temperature-setting, phenol-resin adhesive, (2) an alkaline catalyzed, intermediate-temperature-setting,

Fig. 6—Structural sandwich wall panel tested under vertical load

phenol-resin adhesive, (3) an alkaline catalyzed, room-temperature-setting, resorcinol-resin adhesive, and (4) an alkaline catalyzed, high-temperature-setting, phenol-resin adhesive.

The bonding of most of the experimental sandwich panels was done in hot press equipment. Adhesive was applied to both the core and facings with a rubber roller or an ordinary paint roller at the rate of about 22 grams per square foot of surface, one-half to the core and one-half to the facings. Core and facings were allowed to stand after the spread of adhesive to permit the evaporation of the solvent. Panel components were then assembled and placed in a hot press at a temperature of 230F. (for the acid catalyzed phenol adhesive) to cure the adhesive. Pressures ranging from 15 to 50 lb. per square inch were used, depending on density and type of core construction. Test panels up to 14 ft. in length and 6 in. in thickness were made in a 4 ft. x 4 ft. laboratory press, using step-pressing techniques.

The use of special presses is indicated for sandwich panel manufacture. The pressures required are usually lower than those obtainable in the range of good pressure control on ordinary plywood or plastic presses. Because of the low pressure requirements, simpler and perhaps less costly presses could be used.

Properties

Strength data were obtained on both large and small sandwich panels comprising paper honeycomb core with facings of veneer, plywood, hardboard, asbestos board, and aluminum, or other materials.

Strength tests conducted on large size sandwich wall panels, 3 in. thick and having plywood facings, indicated higher shear strength developed in bending and greater resistance to vertical loads than found in conventional house construction. These panels withstood maximum loads in bending of at least 12 times the design loads of 20 lb. per square foot sometimes used for house panels.

Table 1 shows strength data for sandwich panels of various thicknesses and comprising different facings. Most of the information on the 3-in. thick panels was obtained by experimentation, while values for the 1 and 2-in. thickness were calculated mathematically. It may be seen from the table that when reducing the thickness of the panel from 3 in. to 1 in. the stiffness is decreased 10 to 15 times, and the maximum load that it will support is decreased three to four times. To meet a span-deflection ratio of 270 or more under the uniform load of 20 lb. per sq. ft., a structural sandwich wall panel on a span of 96 in. would have to be more than 2 in. thick if its facings were of ¼ in. Douglas fir plywood.

Bowing of panels due to differential moisture and thermal conditions was found to be of approximately the same order as that of insulated, stressed-facing panels made of plywood glued to wood frames. The fire resistance of honeycomb panels is appreciably higher than that of nearly hollow panels with like facings. Filling of cells with foamed resin further increases fire resistance and improves thermal insulation. Results of accelerated aging tests are favorable. Durability and bowing under outdoor conditions are under study in a sandwich-panel test unit, which was built in 1947 and is still in good condition.

Animal glues provide economy and facilitate papermaking

RICHARD TUTT, JR.
Technical Representative
Peter Cooper Corporations

JUST WHEN AND BY WHOM it was first discovered that the proteinaceous colloids gelatine and/or animal glues had a pronounced coagulating, agglomerating, or flocculating effect on solids in aqueous suspension is somewhat obscure. The brewing industry has employed isinglass (a fish gelatine) to clarify beers longer than the memory of living man.

It is a matter of record that in 1924 Karl Sveen, a Norwegian, applied for a patent in his country, followed in 1927 by the granting in the United States of U.S. Patent 1622474, covering the introduction of chemically modified animal glue solutions to mordanted papermaking materials, as they are about to be passed to the fourdrinier wire, or the cylinder mold on board machines, to secure the accelerated agglomeration and improved retention in the web of the forming fiber sheet.

The commonest types of papers that employ this method are book, magazine, rotogravure, publication and offset printing grades made from groundwood, sulfite, soda pulps and admixtures carrying clays, talc, pearl filler, calcium carbonate (in one instance calcium sulfide) pigments. There is also considerable usage in mimeo, bonds (particularly air-mail bonds), writings, opaque-waxing grades (bread and soap wraps) pigmented with titanium. Some additional usage is found in clay filled super-news, wallpaper hanging, base coating rawstocks, and clay or titanium pigmented top-liner (patent coated) boxboard stocks.

Its first commercial introduction to paper mills in the United States came in the fall of 1936. Experimental results in several eastern book paper mills were sufficiently encouraging to warrant making permanent installations in the spring of 1937. Its acceptance gradually spread to midwestern mills later that year and in 1938. Canadian installations began about 1940. Few mills that made permanent installations have ever discontinued its use.

General Observations

When properly prepared and matured, dilute chemically modified glue solutions are continuously metered to the stock between the chest and the wire. What physical changes are observed to take place? Standing in front of the suction couch roll of a fourdrinier, it will be but a matter of seconds after the glue's introduction that an observer will note a change in the reading of the vacuum gauge. If this gauge had been reading 13 inches, it will creep up to 14, 14½ approaching 15 inches. Similar changes in gauge readings take place at the flat (suction) boxes. The sheet will appear to have a less "wet" appearance between the dandy roll and the couch going to the wet-press section. From this it is quite apparent a change is taking place in the rate of drainage through the wire. Samples of the drained water will show a marked reduction in the quantities of fine fibers, fillers, and pigments slipping through the wire meshes into the white water, and a clearer appearance to this separated water compared to similar samples taken prior to glue addition.

As the dried sheet reaches the winder an increase in basic weight is quite apparent, requiring adjustment. When the weight correction has been made "tear-outs" from the reel of filled or pigmented grades are found to have a higher ash content, with improved opacity and brightness. When internally

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All technical data herein contained is offered solely for general informative purposes. For specific recommendations in preparation and usage of animal glue consult your glue supplier.

sized, there is an increase in sizing value; colors from dyestuffs have been deepened. It is likewise apparent an adjustment downward in the furnish of pigments, fillers, rosin and/or other beater-sizing materials, and dyestuffs is in order.

Specific benefits

One extremely interesting observation occurred some years ago at a midwestern mill trying to make a hard sized publication sheet, highly filled with clay. To carry the desired percentage of clay considerable difficulty ensued to maintain desired sizing value. The use of animal glues not only enabled the mill to secure desired opacity, brightness, and printing qualities with less clay in the beater furnish, but it also made it possible to obtain the required sizing values with approximately 50 per cent less rosin-size.

The ability to make the same grades of paper with a leaner back-water system has benefited wire life because of the lessened abrasion from reduced quantities of clay in constant recirculation. Reports have indicated that in some cases increases in wire life approached 20 per cent.

An examination of the sheet, after required adjustments in furnish have been made, usually indicates an improvement in the distribution of the fine fibers, fillers and pigments. Further beneficial effects because of better drainage through the wire include faster machine speeds and easier drying.

The author recalls the experience of an eastern mill making mostly clay filled sulfite printing grades. Considerable overflow of back-waters—not immediately recirculated—from all their machines were collected in a common white-water tank. Some make-up water for re-use on the machines, as well as dumping water for beaters, was drawn from it. There always had been considerable compact clay sedimentation in this tank that required removal by shoveling on weekend clean-ups. After permanently installing a Sveen system the very limited residual clay in this tank was easily removed by flushing with a hose.

On occasion, the subject of "two-sidedness" of colored stocks has been brought up in conjunction with animal glue applications. This occurrence appears to be controversial. While there have been instances where the "two-sidedness" has become more pronounced upon introduction of animal glues, there have been other cases where just the opposite happened and marked improvements in reducing "two sidedness" were definitely observed.

Now and then the question is raised as to the effect of animal glues in connection with pitch troubles. Many technical discussions have taken place on the subject of pitch. Some mills employ diatomaceous earths along with clays to absorb and aid in keeping pitch dispersed. Frequently Tamol and/or Blancol is used as a dispersant.

The effect of animal glue addition does not stop with the formation of the web. It carries through with the remaining suspended solids in the white-water, aiding in their separation and recovery and improved clarification of the white-water in mechanical saveall equipment or by subsequent treatment in flotation or sedimentation type recovery systems. Reductions in quantities of filterable solids in the clear effluent from mechanical (wire screen covered cylinder type) savealls of 50 to 60 per cent, sometimes more, are not unusual.

It is often asked as to what pH range the uses of animal glues may be limited in papermaking. When the proper type and grade of glue is properly prepared by the correct formula (with the exception of certain unfilled highly alkaline stocks) the pH of the machine system appears to have little or no limitation on the glue usage. Various stocks internally sized with rosins precipitated with alum, or alum and sodium aluminate, may have a pH range anywhere from around 4.0 to 6.6 or 6.8. Calcium carbonate pigmented stocks are not rosin-sized, alums are omitted, and the pH ranges generally from 7.4 to 7.8. So far as retention on the wire is concerned, satisfactory improvement with animal glues is maintained all the way through from 4.0 to 8.0. There are mills making publication grades heavily pigmented with calcium carbonate that have continuously used animal glue for retention for over 10 years.

Glue selection and formulation

Considering that there is a wide range of types, grades, and protein values in animal glues employed for industrial purposes—with market prices to correspond—it is not surprising that different grades and types react differently with varying results. These grades range all the way from the low jelly-strength value packing house type of green bone glues (60-85 grams test) upwards through naphtha extracted types from dried bones to the high jelly-strength, high protein-valued hide glues testing upwards of 400 grams (standard methods National Association of Glue Manufacturers).

The author working in cooperation with P. M. Loddengaard early in 1937 conducted a series of commercial trials in some of the eastern mills to determine which grades and types secured optimum results and lowest net cost per ton of paper. All grades of glue were employed in these trials. It appeared then, and has been competitively confirmed frequently since, that hide stock glues of high protein value, testing approximately 225 grams jelly-strength, gave best results over the widest range of pigments and machine pH conditions using 1¾ to 2 lbs glue solids per ton of paper made.

Higher testing grades than 225 grams did not show sufficient increases in retention to warrant their usage economically.

Lower testing grades than 225 grams required increased dosages dependent on their intermediate jelly or protein values. The lowest jelly strengths (85 grams) require about 40 per cent or more glue solids per ton than the 225 gram test hide glues.

At the time these evaluations were made, the only known formulation for preparing these dilute glue solutions called for the use of aluminum sulfate (papermakers alum) for activation. To secure best results it was desirable to mature or "age" the batches, preferably at temperatures of 650°F, or lower, for 24 hours, during which period the solution has been said to change from hydrophillic to hydrophobic, increasing its colloidal activity. Critical control of batch pH was quite important.

In 1944 the author working with Charles R. McKee and J. R. Hubbard developed the fact that chromic potassium sulfate (chrom alum) provided superior colloidal activity to hide glue solutions than papermakers alum. It also permitted a shorter cycle of "aging" (6 to 8 hours) without critical regard to batch temperatures. Dosages required to secure equivalent results using hide glues of 225 gram test values prepared with the chrome alum formula are very often 40 to 50 per cent less than those with the earlier papermakers alum formulation. U.S. Patent 2403144 was granted July 2, 1946, to protect this improved preparation. Permission to use this patent without fees or charges is given to the trade under certain conditions on application to Peter Cooper Corporations. It has received wide acceptance.

Low jelly value bone glues (60 to 85 grams test) with their complex protein-proteose-peptone structure are unstable and precipitate in the presence of chrome alum.

Current dosages employing the patented chrome alum preparation with 225 gram test hide glues now generally approximate 1 to 1¼ lbs glue solids per ton of paper; other grades and formulations may be expected to require at least 2 to 2¾ lbs glue solids per ton for equivalent results depending upon grade. This again reconfirms the fact that the better grades of hide glue provide greatest economies regardless of price differentials.

Paper and paperboard making—XXV

HARRY WILLIAMSON

Practical Examples of Slice Control

Harry Williamson —author of Paper and Paperboard Making

This is Part 5 of Mr. Williamson's discussion of the fundamental principles of the fourdrinier machine, continuing excerpts from his forthcoming book covering all phases of paper and board manufacture. The book is to be published by Fritz Publications Inc.

The forward wave

BY RAISING THE "HEAD" in the pond either by closing the slice opening a little, adding more water, or a combination of both—the "slice velocity" may be increased so that the mixed volume meets the wire at a speed visibly faster than the speed of the wire mesh. This will create a "forward wave" as the mixed volume is delivered to the formation area.

The immediate EFFECT of the forward wave is to RETARD the drainage of the water through the wire mesh in the formation area immediately adjacent to the slice. Because the mixed volume is running faster than the wire, the initial turbulence delivered TO the wire is more violent, and therefore LESS water will pass through the wire mesh. Less fiber is settled or formed on the surface of the wire mesh and we may describe this action as "delaying" the AMOUNT of INITIAL formation by slice action rather than by hydration of the fiber or beating the stock "SLOW." (See chapters on stock preparation).

The increased turbulence, therefore, keeps the fibers in suspension in more violent contiguity with each other than they would be with the lesser turbulence of the mixed volume delivered at the same speed and therefore CARRIED by the travel of the wire.

The resultant formation would be "CLOUDY" rather than clear and, if the forward wave is excessive the continued turbulence would have the tendency to roll the fibers over each other, changing the appearance of the formation from "cloudy" to "LUMPY."

The forward wave formation is used in the manufacture of such papers as envelope, bag and kraft wrapping where the "clear look through" of the formation of the finer printing papers is not as essential as certain STRENGTH characteristics.

The strength values of the finished sheet made by use of the forward wave formation will be affected in the following manner: TEAR with the grain will increase; TENSILE and STRETCH across the grain will increase; folding and creasing will be more nearly even with and across the grain. The MULLEN test will have a tendency to be SPOTTY rather than even, the result of formation of aggregates of bundles of fibers with light connecting areas of individual fiber formation due to the extra turbulence during formation.

Fibers which have been well "beaten" part with water slowly. Fibers not so well "beaten" part with water freely. Unbeaten fibers are referred to as "raw" and of course are exceptionally "free." Other factors,

such as the species and physical dimensions of the individual fibers, must also be taken into consideration in relation to the time of water drainage during the act of formation. In this discussion of the practical operation of the slice it is necessary to remember these facts and that the phraseology of "SLOW" and "FREE" stock pertains to the DEVELOPED condition in the preparation of the fibers and is correlated to the VOLUME of water used to form the sheet.

The VOLUME delivered to the wire is controlled by the area of the slice opening and, in paper mill language, we say "STOCK SLOW, slices LOW," and "Stock FREE, more water you see."

The back wave

The back wave formation occurs where a wider open slice and a larger volume of water are required to form the sheet, as with the "furnish" comprised of "long FREE fiber."

The mixed volume is delivered to the wire at a slice velocity visibly LESS than the running speed of the wire. The immediate effect is the creation of a series of separate FLOW SPEEDS throughout the liquid DEPTH of the mixed volume ON the wire. This condition may be described as a "continuous settling" of fibers in an interchanging STRATA-like flow throughout the liquid depth of the mixed volume as the sheet is being formed.

As the mixed volume leaves the slice opening and makes contact with the running wire mesh, the BOTTOM flow from the BASE of the pond is instantly PULLED away by the faster speed of the wire. The TOP flow which comes in contact with the slice-lip as it passes through the slice opening, with a delivered velocity LESS than that of the wire, rolls over and forms a back wave as the bottom flow is pulled from under it. The visible effect is that of a series of back waves leading in the center and spreading out across the width of the formation area.

Using the "high slice opening" with back wave formation, drainage of water and therefore formation commences the instant the mixed volume comes in contact with the wire. INITIAL formation is immediately in effect. We have already noted that the speed of the wire PULLS the bottom strata of the liquid, and we have also noted that a confluence of converging streams in the pond immediately approaching the slice opening causes the alignment of fibers to be parallel to the stream flow.

Such alignment of fibers due to the flow action passing through the slice opening will not only be maintained but, because the faster speed of the wire is NOW a PULL action, will be accentuated on the fibers which are in the bottom strata of flow and which first settle on the traveling wire to comprise the INITIAL formation.

Under these circumstances the initial formation, or "wire side" of the finished sheet, will be more "grainy;" more of the fibers will be formed individually lengthwise and parallel to the direction of the wire than the intermediate and "top side" formation.

As we know, "all fibers will SHRINK MORE across their diameter than along their length." Because of this fact the back wave formation, carried to extremes, would result in the finished sheet CURLING TO THE WIRE SIDE. This "curling" is the result of the greater TENSION of the wire side of the sheet caused by the greater TOTAL shrinkage of the fibers comprising the initial formation.

As the alignment of the fibers parallel to the wire is caused by the proportionately faster running speed of the wire than that of the mixed volume coming directly in contact with the wire during the INITIAL formation, such alignment is proportionately LESS as the thickness of the sheet formation is built up by the intermediate and upper strata of the mixed volume. The total "curl" effect in the finished sheet is therefore in much greater evidence on a THIN sheet than on a thick sheet of paper.

A sheet of 2.5 points (0.0025) thickness or 25 ream weight would require definite counteracting application to eliminate the "curl," the "curl" being towards the wire side of the sheet; while a 6.0 point sheet (0.006) made under exactly the same operating conditions would show very little tendency to "curl."

It should be noted that the alignment of fibers in the initial formation of any sheet caused by "slice velocity" being less than the speed of the wire is only ONE of the contributory causes of "curl." The reader must NOT assume that this is the sole cause of "curl." As a rule, "all curl in a sheet of paper or paperboard is the result of a GREATER TENSION of one side of the sheet over the other." The cause may originate in the beating of the fibers; it may be attributable to the manner of formation of the fibers as in the "back wave" formation. Whatever the cause, it is consumated in the drying and becomes visibly evident at the end of the drying process.

As the "curl" characteristic from any original cause is consumated by the shrinkage tensions set up by drying the paper, then the tendency to "curl" may be corrected by the application of moisture. This is generally accomplished by use of a "sweat dryer" or "sweat roll" on one side of the sheet, or on the calender stack by use of a water box or steam shower.

While the above comments on the characteristic of "curl" in a sheet of paper were expounded to stress the action of "back wave" formation, it will be helpful to carry this subject further to a conclusion of cause and effect in relation to "curl." The following statement, and the many implications arising therefrom, may be accepted as a guiding rule.

"All papers and paperboards will 'curl' AWAY FROM the moistened side."

By using the "back wave" type of formation, the strength values of the sheet follow the general characteristics of the "forward wave" sheet in relation to "tear," folding and creasing, spotty mullen test, and the formation "look through" will be from cloudy to WILD in ratio to the "FREENESS" of the stock used.

If the "back wave" is carried to the extent of making the formation "wild" the DENSITY of the sheet will be LESS and the POROSITY test becomes correspondingly HIGHER. This formation is advantageous for total "saturation" papers; the strength values of the sheet are good enough to withstand the tension strains

of the saturating equipment, and the saturating liquid used will penetrate and diffuse through the sheet quickly. This, of course, enables the saturation equipment to be run at an efficient operating speed.

Creping tissue formation

The formation of a sheet of tissue paper which is to be creped before the sheet enters the dryers is an excellent example which combines ALL the factors of "slice velocity," "alignment of fibers," "high Heads," "long fibers," "low consistency" and the ELIMINATION of the major counteracting force which we apply in other grades of papers to deliberately disturb the formation of fibers in parallel alignment with the wire.

The reader will find this example embodies ALL the principles of formation from both the positive and negative application of the forces within the control of the papermaker on the actual paper machine.

As creping tissue was successfully made long before we thought of taking a series of continuous photographs of the action of the fibers during formation, or discussions of the longitudinal flow effect on the fibers passing through the slice opening became perennial subject matter wherever papermakers foregather, it is quite apparent that successful PRACTICAL operation preceded DETAILED specific information of some of the factors pertaining to "formation."

As with so many other sectional operations in the manufacture of paper we knew HOW but we did not know specifically WHY. By trial and error we arrived at an experienced operation with successful RESULTS without knowing too much of the DETAILS of cause.

Until we achieved the modern high rate of running speeds it was NOT NECESSARY to consider the effect of slice velocity on the alignment of fibers parallel to the wire; the "pond" was considered only as a "source of continuous supply," and the functions of the slice were those of impounding the mixed volume to a head height requisite to the running speed and REGULATE and LEVEL the mixed volume delivered to the wire.

All OTHER control of the formation was accomplished AFTER the mixed volume was actually ON and traveling WITH the wire at the SAME speed as the wire. There was ample TIME to CONTROL the directional settling of the fibers into the desired formation. In the manufacture of heavy weight papers the use of the second slice was regarded as an adjunct to the use of a lower consistency of the mixed volume than would be possible by the use of only one slice. The words "slice velocity" with their modern meaning had not yet become part of the vocabulary of the papermaker.

The reason this example of the FORMATION of a sheet for creping purposes is important to the student of papermaking is because it is the ONLY standard commercial paper which MUST have the majority of the fibers actually in alignment longitudinally and parallel to the travel of the wire. In other words, with all other standard papers we devise means and applications of force to DELIBERATELY criss-cross the fibers with each other; we consider the confluence of converging streams from the pond to the slice opening with the resultant alignment of fibers a DETRIMENT to normal formation; something which must be counteracted by the application of another force during the formation.

Making creping tissue we have the opposite condition in its entirety. If we could have ALL the fibers aligned in finished formation parallel with the TRAVEL OF THE WIRE, we would have achieved the PERFECT formation for creping paper.

However, for reasons already discussed and some which will be dealt with in subsequent paragraphs, it is just as impossible to form ALL the fibers longitudinally as it is to form a normal sheet with the fibers EQUALLY criss-crossed with each other. During the formation of ALL machine made papers the fibers in suspension will follow the STREAM FLOW ON the wire the instant the force of slice velocity is neutralized by the combination of drainage of water and the wire speed taking control.

As the fibers COLLIDE with each other in STREAM FLOW the individual fibers change whole or partial DIRECTION of flow, thereby becoming criss-crossed and NESTED with each other. The application of the "shake" device, either by length of stroke or number of strokes per minute, or a combination of both, is the unit of control with which the papermaker CREATES criss-cross CURRENTS in the mixed volume in the FORMATION AREA on the traveling wire.

Of course such active currents may only be created while the mixed volume on the wire is in a FLUID condition. As the water drains through the wire mesh, gradually EFFECTING formation, currents and "flow" as such are gradually brought to rest, collision of fiber with fiber ceases, formation is practically complete and the condition of the newly formed sheet may be said to be transposed from a FLUID condition of liquid volume to a NON-FLUID VIBRATORY MASS with the fibers from the upper strata of the original "flow suspension" settling into their final position in the sheet.

As we summarize the operating conditions governing the formation of a sheet of tissue for creping paper we are REALLY summarizing ALL the important factors pertaining to formation relative to the "collection," "delivery," "distribution" and "orientation" of fibers from suspension in water to the finished formation, preparatory to the application of vacuum which "pins" the formation into position, of ANY sheet of paper.

Those conditions which are inherently advantageous to our objective are taken advantage of and, wherever possible, accentuated. Those mechanical devices such as the "shake" and distributing rolls behind the slice, which we use for the normal type of formation to criss-cross the fibers, are either removed from the machine or NOT USED. Contrary to their normal use the spacing of the "tube rolls" which by contact with the underside of the traveling wire mesh exert a capillary attraction on the flow of water through the mesh, is arranged to DECELERATE drainage of water so that the fibers remain longer in suspension and therefore a LONGER TIME under the influence of STREAM FLOW.

Ten steps to better employee relations

Bettering the relationships between labor and management is a goal constantly in the minds of both parties concerned. There is always room for improvement no matter how happy those relationships.

ERNEST W. FAIR

"YOU HAVE TO UNDERSTAND THEM. When an employee has a complaint or grievance, it is almost impossible to arrive at a good conclusion without first learning to understand the reasons for the complaint, why it is made and what lies behind the grievance."

Those are the sentiments of more than two score executives contacted on the question of how the paper industry executive can better handle the problem which is becoming more and more prevalent in these times.

"We used to have one or two complaints a week . . . now we have dozens," several observed. Everyone's nerves are on edge, their demands more exacting . . . those are reasons.

In paragraphs to follow are ten of the most often repeated methods of handling the problem. They were mentioned by almost every executive as having been successful in his own use. They are applicable to any size operation.

1. "Don't settle grievances immediately" is the advice of every executive. Interview the employee who has a complaint or grievance and hear his story with a friendly discussion of the problem. But don't attempt to settle it then and there.

It pays to take a little time to reach a decision. It pays to take time to formulate the way to handle the problem. When the decision is presented, the employee should also be told the reasons for that decision.

This procedure has been recommended by almost every successful executive as a "must." "Snap judgement," they say, never pays off in settling any employee grievance.

2. "Explain what you do" is one executive's way of presenting another important point. Often an employee complaint can be completely smoothed over when the whys and wherefores behind the occurrence or the rule involved are honestly and thoroughly explained.

Our fellow man can always be trusted to give a better understanding when the reasons for our position on any matter are made clear. No executive has to take an employee into intimate details of the business operation, but oftentimes giving that employee an insight into one's problems will materially aid in doing away with fancied complaints or causes of grievance.

3. "Remember that the employee is usually right from his viewpoint" is another good suggestion to follow. Most of us believe honestly and sincerely that our viewpoint is the right one.

When we approach the solution of a problem with the thought in mind that the employee sincerely believes himself to be right in the stand he is taking, we can much more readily arrive at an adjustment of the situation.

4. "Don't quibble" is one executive's advice, and others add such suggestions as not procrastinating or giving foolish reasons for one's settlement of the problem or attempting to "josh" an employee out of a grievance.

Such procedure infuriates any employee with intelligence. It gives the employee the thought that we consider their complaint childish and does nothing toward smoothing the path toward a mutual understanding.

5. Be quick to acknowledge an honest error—as soon as it has been discovered. This offers a demonstration of one's honesty and fair dealing. It inflates the ego of the employee. Trying to cover up an honest error will only make matters worse; everyone realizes that no one is perfect and that all of us make mistakes.

When these occur, the average executive will automatically solve his problems by being eager to admit his error and correct it without argument or discussion.

6. Imaginary troubles on the part of employees are encountered almost daily. Solving them calls for understanding that, though they are in fact imaginary, they are very real and important to that particular individual.

7. Maintaining close contact with employees makes it much easier to settle any problem. Satisfying and adjusting complaints and grievances is made more difficult when we have lost touch with the employee viewpoint. When we have an understanding of ourselves from the other side of the fence, we will find adjustment of differences a much easier matter.

8. A person convinced against his will is still unconvinced. The speediest way to secure a satisfactory solution to anyone's complaint is to try to get him to convince himself. Using high pressure arguments merely convinces a person at that particular moment. When our "spell" has worn off, the complaint or grievance becomes of greater magnitude and will be even more difficult to settle.

9. "Be wary of establishing a precedent in arriving at a solution" is advice often heard. It is one of the reasons for the first suggestion: that a period of time be allowed to elapse before presenting a solution. It is wise to settle any grievance if possible, but not when this will create a precedent that may be harmful in the future.

10. A sense of humor is always important in handling any complaint or grievance. The average employee presents his complaint with a chip on his shoulder and a belligerent frame of mind. We have to change this before a reasonable solution can be worked out. Nothing will do it better than a good sense of humor with understanding.

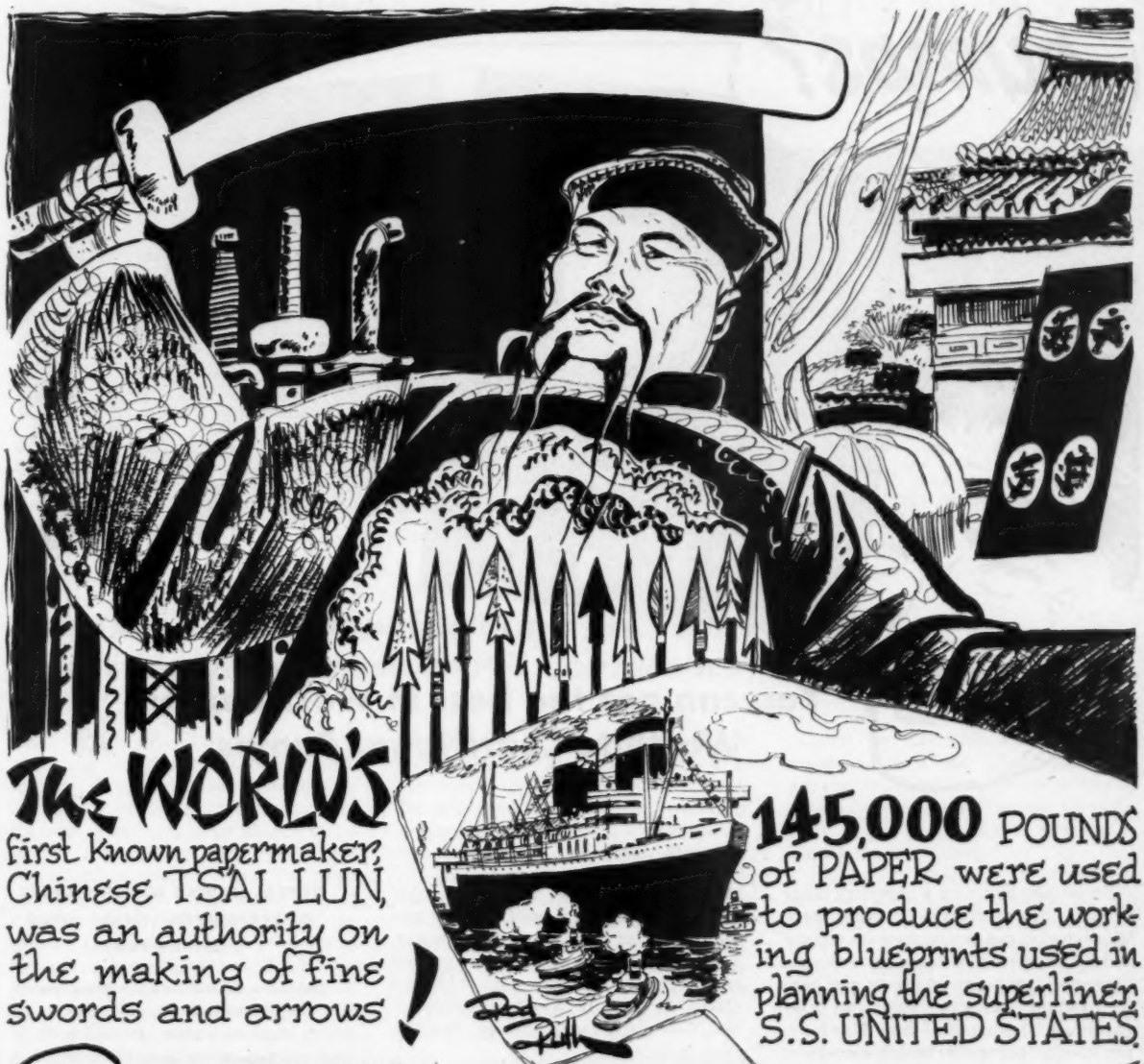
There is always something different about every complaint or grievance; the foregoing solutions are designed to handle the basic background to all complaints, but each needs additional treatment of its own.

Every problem needs individual analysis and treatment for solution, but basing such individual treatment on the procedures outlined above will make even the most difficult problem an easier one to handle.

Difficult times create complaints and grievances among employees; even the best firm will have them. Making the solution to each problem the simplest and most straightforward one has always been the wisest procedure to follow.

Mr. Fair is a member of the Associated Business Writers of America and has written numerous articles covering a wide range of industrial topics.

PAPER SKETCHES



THE WORLD'S first known papermaker, Chinese TSAI LUN, was an authority on the making of fine swords and arrows!

145,000 POUNDS of PAPER were used to produce the working blueprints used in planning the superliner, S.S. UNITED STATES.

ODDLY ENOUGH, hand made papermakers of the East have always used flexible moulds made of bamboo strips or grass while their European brethren stayed with rigid moulds, fashioned from metal wires.

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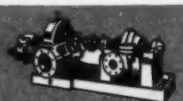

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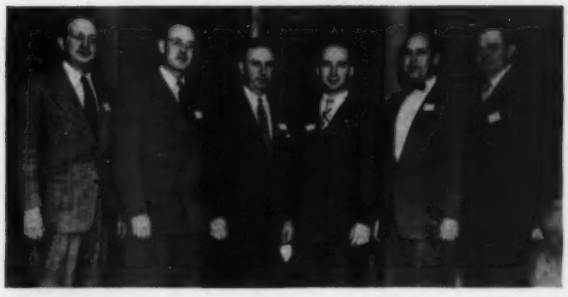
CONFERENCE LEADERS at Syracuse included (l to r) Richard Lindenfelser of American Cyanamid; Edwin C. Jahn, associate dean for physical sciences and research at the State University College of Forestry, Syracuse; B. G. Ranby and H. F. Mark, both of the Polytechnic Institute of Brooklyn, and Russell T. Dean, Interchemical Corp.; Dr. Jahn was chairman of the Conference



PLASTICS APPLICATIONS to paper were the subject of a panel discussion during the Tappi conference at Syracuse; participants were (l to r) R. T. Nezzaro of Westfield River Paper Co. (chairman); J. J. Aid, Robert Gair Co.; Joseph Pullman, American Cyanamid Co.; Norman Greenman, Rogers Corp., C. A. Clarke, B. F. Goodrich Chemical Co., and P. H. Yoder, Pyroxylin Products Co.

Resins in Paper Manufacturing and Converting Discussed at Syracuse TAPPI Conference

RESINS OFFER THE POSSIBILITY of solving an increasing number of problems in the paper manufacturing and converting industries, which explains the ever growing interest shown to research and studies dealing with the application of resins to paper and paper products. Special requirements of strength, flexibility, and chemical resistance are met by the use of resins in paper and paper products. Grease resistant papers can now be produced by the use of a variety of resins. The use of resin additives may impart greater strength to sheets made of the short fibered pulps which are coming into greater prominence due to the decreasing availability of long fibered pulps. Higher opacity sheets with higher filler contents may be possible with the inclusion of suitable types of resins. The use of resins may also reduce paper manufacturing costs by reducing the beating operations.

These were some of the problems discussed at the Eighth Paper Plastics Conference of TAPPI held at the State University of New York College of Forestry, Syracuse.

Polyester resins and laminates

Speaking on polyester resins and paper laminates, Russell Dean, Interchemical Corp., said that polyesters are now being produced and consumed at the annual rate of 20,000,000 pounds. Of extreme importance in processing polyesters, he said, is the control of the rate of cure by a proper choice of catalysts and activators. There are now 15 to 20 commercially available peroxides used for catalysts of polyesters. Benzoyl peroxide and methyl ethyl ketone peroxide are the two most important ones in this group. Among the activators, Mr. Dean mentioned amines, mercaptans, and metal salts.

R. Lindenfelser, American Cyanamid Co., discussed melamine type resin for beater addition processes to form laminated sheets for molding preforms. He mentioned a new modified melamine resin which appears to have unlimited color possibilities and good electrical insulation properties. Color instability of existing resins, he said, has limited the growth of this industry, the scope of which should be greatly increased through a general application of the new resin.

The application of polyester resins in the presence of both catalyst and accelerator by the use of a double nozzle spray gun was mentioned at a panel discussion. In this application, the resin coming from one nozzle contains the catalyst and the resin from the other nozzle contains the accelerator. This appears to be the only practical way of applying this mixture, because the resin gells very rapidly in the presence of accelerator and catalyst.

Norman L. Greenman, Rogers Corp., described the preparation of Duroid 700 which is obtained by adding phenolic resin to the fiber in the beater. Duroid 700, the speaker said, is equivalent to vulcanized fiber in electrical applications.

Applications of vinyl acetate polymers to paper

R. W. Reiter, National Starch Products, Inc., described the application of vinyl acetate polymers to paper according to the five or six methods now used in resin application:

(1) *Application in the beater.* Polyvinyl acetate emulsions show promise as additives to improve dry strength, which may eventually lead to reducing the beating time and, therefore, cut down the cost of making the sheet. The main problem here is to retain the polymer in the paper by precipitation with alum, for example, or by making the dispersion cationic and more substantive to the fiber itself.

(2) *Size press or calender application.*

The material for this application has to be thin and fluid. Polyvinyl acetate emulsions, Mr. Reiter said, impart improved stiffness, grease resistance, good color, and aging properties. A problem here has been the tendency for the polymer to transfer on the drying rolls or calender stacks due to its tackiness while wet or hot and, for this reason, antiblocking agents such as casein, starch, and CMC are a necessity.

(3) *Application by impregnation.* In this method the wet web or the dry paper is run through a bath of resin. A fairly open, usually unsized sheet is used for this process. A difficulty encountered in this process is the fact that the resin tends to deposit on the surface of the sheet rather than to penetrate the sheet. Smaller particle size emulsions and the use of wetting agents recommended in this application.

(4) *Laminating paper.* Polyvinyl acetate materials have an important application here because of fast set, freedom from odor, non-toxicity, good color, and grease proofness.

(5) *Application by coating.* Many latices of the synthetic rubber type, the speaker said, are very thin fluid materials and not suitable for this type of application because of their penetration into the sheet. This disadvantage, however, can be minimized by formulation with suitable thickening agents. Polyvinyl acetate emulsions have a viscosity in the correct range for coating application, particularly by roller or knife coating.

Polyvinyl acetate polymers can be compounded with a number of modifying ingredients such as plasticizers, solvents, resins, and wax dispersions, which are not necessarily compatible in the true sense with the polymer.

Water soluble colloids such as starch, carboxy methyl cellulose, alginates, polyvinyl alcohol are of great importance as viscosity controlling agents and as additives to minimize penetration of the resin particles into the porous stocks. This is especially necessary where particle size of the resin emulsion is small.

Resins such as rosin derivatives, urea formaldehydes, Cumars, and waxes are used as extenders and modifiers. To obtain compatibility with these, it is sometimes necessary to raise the pH of the polyvinyl acetate emulsions.

Polyvinyl acetate also lends itself to integral plasticization where the flexibilizing agent is a monomer itself and is permanently locked into the molecule. A practical application of this integral plasticization has been in the grease proof coating of paper.

Other papers presented at the meeting were "Machinery for Coating Paper with Plastics" by F. W. Egan, of Frank W. Egan and Co.; "From Art to Science in Envelope Manufacture" by P. B. Davidson, Mellon Institute of Industrial Research; "Methods of Reverse Roll Coating" by R. F. Vokes, Dilts Machine Works; "Recent Progress in Measuring and Interpreting Adhesion" by H. F. Mark, Polytechnic Institute of Brooklyn; "Recent Studies on the Morphology of Cellulose Fibers, etc.," by B. Ranby, also of the Institute, and "Abrasion Testing on Decorative Laminates with the Armsbrook Abrador" by F. L. Graves, American Cyanamid Co.

New Group Formed by APPA, NPA; Henry J. Perry Secretary

Formation of the Waste Paper Utilization Committee has been announced as a joint project of the American Paper & Pulp Association and the National Paperboard Association. Chairman of the group is Earl Weaver, manager of the purchasing department of International Paper Co. The full-time secretary is to be Henry J. Perry, editor of *Paper Trade Journal*.

Henry J. Perry

Chemical concerns, paper and board manufacturers, publishers, and other interested groups will participate in an effort to carry on a continuing program for the elimination of present handicaps in the collection and preparation of waste for paper stock.

Synthetic Latices Discussed at N. Y. Metropolitan Tappi

A technical program comprising a panel discussion on the use of synthetic latices in the paper industry was featured at the November 12 meeting of the metropolitan district, Empire State Tappi. The gathering was at Fraunces Tavern, New York, N. Y., with more than 90 members and guests present.

R. L. Steller of B. F. Goodrich Chemical Co. discussed Hycar latices, which he described as water emulsions of acrylonitrile and butadine. These latices have exceptional adhesion and grease resistance, he declared, and are used as pigment binders, saturants, and for beater additions. E. J. Heiser of Dow Chemical Co. described the advantages of using latex as a pigment binder in coating, such as improved resilience, thermoplasticity giving better flow under the heat of calendering and smoother surface, dimensional stability, elimination of curl, and non-hygroscopicity, which minimizes dimensional changes, all of which make for better printing. He also discussed size press application of pigmented latex coatings.

J. S. Hickman of the Rubber Chemicals Division of E. I. DuPont de Nemours & Co., Inc., gave the history of the use of both natural and synthetic latices in paper. He described the wide variety of uses for Neoprene in such products as filter papers, twisting papers, gasket papers, artificial leather, backing for wall tile, and a wide line of wet strength papers.

Concern for Industry's Future Voiced by Chicago Banker

Three factors that give concern to the banker when viewing the future of the pulp and paper industry were listed by A. Newell Rumpf in an address before the October 22 meeting of Chicago Tappi. Mr. Rumpf, vice president of the Harris Trust and Savings Bank of Chicago, declared that the concern stems from taxes, cost of machinery replacement, and expansion.

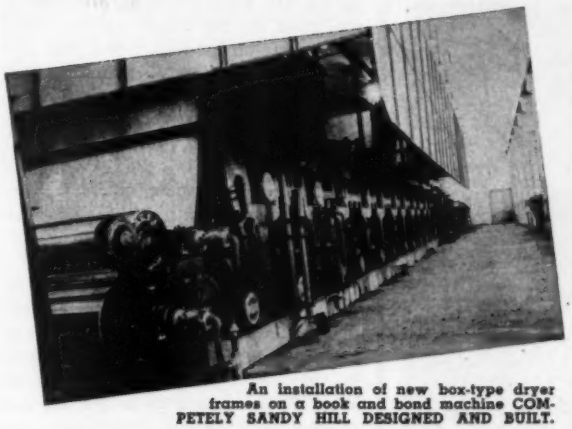
He recalled that in a similar talk before the Chicago group a year ago a note of pessimism was given. This was because the relation of production to basic demand indicated that output was ahead of actual usage. Orders received were less than productive capacity. On a short-term basis, it appeared that overall production was on a pretty firm level; however, over the longer period it was felt that a period of digestion was in order. Now, however, in October, 1952, the latest figures indicate that total production is 88.6 per cent of rated capacity. This compares with 99.5 per cent for the corresponding period of 1951. For paperboard, the most recent figure stands at 94 per cent, compared with 90 per cent a year ago.

The reasons for the low activity of the past year are largely known, Mr. Rumpf explained. At the beginning of Korea, a rush of buying of a hoarding nature was instituted. When it became apparent that paper was not in short supply, and when inventories were generally pyramided at the manufacturing and distributing level, a wave of cancellations and retrenchment took place. The first to feel the change were the paperboard producers, indicating that in spite of a high national income the pipelines all along the line were filled.

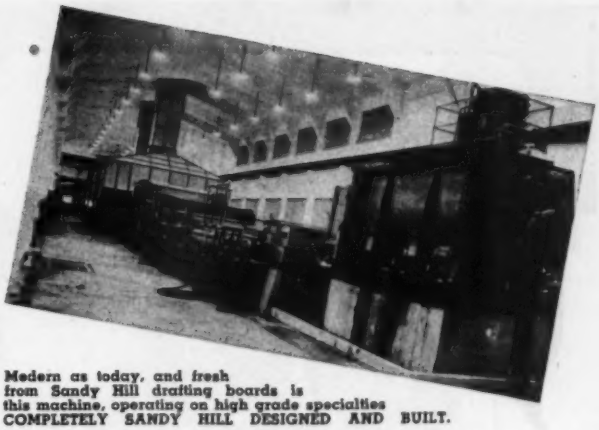
Inventories liquidated

Now it appears that recent excess inventories in the hands of users have been liquidated and that a renewal of the basic strong demand for board and paper products will result. After a slow first half, Mr. Rumpf declared that he expects total board and paper production in 1952 to be somewhere between 24,500,000 and 25,000,000 tons, which would compare with 26,000,000 tons in 1951 and 24,400,000 tons in 1950.

The recent decline in Canadian and Scandinavian pulp prices was to be ex-

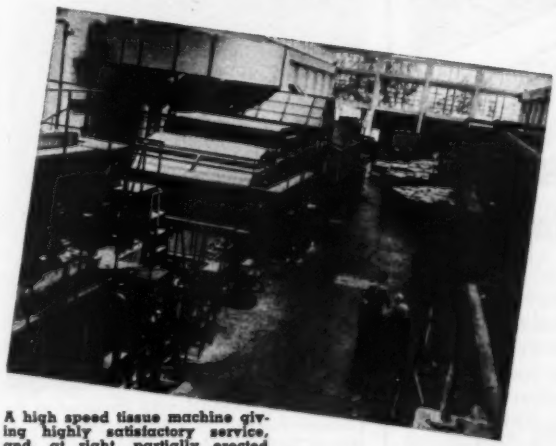


An installation of new box-type dryer frames on a book and bond machine COMPETELY SANDY HILL DESIGNED AND BUILT.

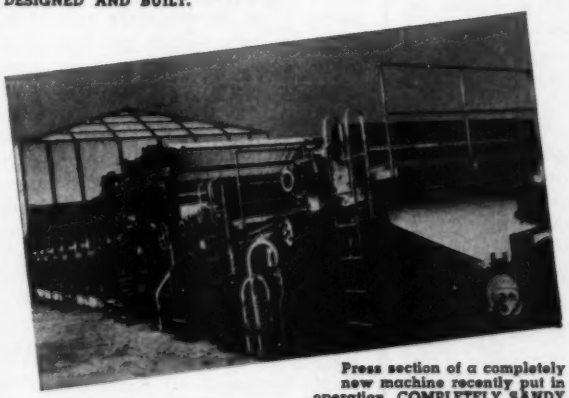


Modern as today, and fresh from Sandy Hill drafting boards is this machine, operating on high grade specialties COMPLETELY SANDY HILL DESIGNED AND BUILT.

Completely Designed and Built by *Sandy Hill*



A high speed tissue machine giving highly satisfactory service, and, at right, partially erected machine-glazed board machine, both COMPLETELY SANDY HILL DESIGNED AND BUILT.



Press section of a completely new machine recently put in operation. COMPLETELY SANDY HILL DESIGNED AND BUILT.

PRODUCING good papers week after week in many large and small mills throughout the industry are COMPLETE paper machines DESIGNED AND BUILT BY SANDY HILL.

These machines and their superlative records for continuous trouble-free operation, are evidence of the established importance of Sandy Hill in the industry.

Another gratifying indication that Sandy Hill is doing a real job is the growth of the Sandy Hill organization. Today Sandy Hill's personnel of experienced engineers and skilled craftsmen numbers ten times what it did only fifteen years ago.

When you start to plan changes in your mill, then is the time a Sandy Hill sales-engineer can be of great service whether it be a complete machine or a minor piece of specialty equipment.

Sandy Hill's new Brochure of Pulp and Paper Making Machinery is available on request.

The Sandy Hill Iron & Brass Works

Hudson Falls, N.Y.

Machinists and Founders Specializing in Paper and Pulp Mill Machinery

Manufacturers of

Adjustable Cylinder Vats
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Pulp Grinders
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"Selective" and Corner Drives
Fourdrinier Paper Machines
"Packer" Screens
Castings
Bleaching Equipment
Scofield Felt Conditioners
Cleveland Type Bearings
Shaker Screens

Another wooden Machine Room Roof continues to give satisfaction

• Schmidt & Ault Paper Company of York, Pennsylvania, knew what a serious maintenance problem they had in the roof over their machine room. Extremely high humidity and temperature in the rooms below made the roof a natural prey to rot and decay.

Starting in 1930, they began replacing the old gypsum roof, section by section, with pressure-treated "Wolmanized"* lumber. After years of satisfactory service, this roof is, according to Mr. Henry D. Schmidt, President of Schmidt & Ault, "... DOING A VERY GOOD JOB. SO MUCH SO THAT WE PLAN TO CONTINUE TO USE 'WOLMANIZED' LUMBER ON ANY OTHER ROOFS OVER ROOMS IN WHICH THE ATMOSPHERE IS INVARIABLY HUMID."

The construction of roof decks, floors and structural members in paper mills calls for the insulating qualities of wood. "Wolmanized" pressure-treatment makes this wood last longer.

Many of your maintenance problems are brought about by the continual presence of heat and humidity. "Wolmanized" lumber can solve these problems. Ask your plant engineer or architect about "Wolmanized" pressure-treated lumber . . . or write for complete information and the folder, "Wood Preservation."

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Wolmanized *Reg. U. S. Pat. Off.

PRESSURE TREATED

Lumber

pected, Mr. Rumpf continued. However, the truth of the matter is that these prices were on the high side a year ago, as a reflection of the abnormally strong pulp demand. For example, Scandinavian bleached sulfite pulp was at $250-$300 a ton in early 1951, and Canadian pulp was $155-$160 a ton, as compared to $145 for domestic pulp. Now, both of these pulps have come down to meet the more realistic (and consistent) domestic prices.

Discussing the factors that give concern to the banker, the speaker said that the impact of federal income taxes on the industry acquired terrific force in 1951. At their peak during World War II they amounted to 9.1 per cent of sales, 11.6 per cent of net worth, and 8.3 per cent of total assets. In 1951 they were 13.1 per cent of sales, 21.6 per cent

ECONOMIC TRENDS were discussed at the October meeting of Chicago Tappi by A. Newell Rumpf

of net worth, and 14.4 per cent of total assets. When income taxes and profit taxes take more than 21 per cent of net worth, against 5.9 per cent for dividends, and when these taxes take more dollars out of the industry than was paid in wages, it would appear that the industry is being bled white, and it is time to check government expenditures.

With the high cost of new equipment to increase productivity, normal depreciation standards are insufficient and must be met out of new capital. This high cost restricts new entrants to the field. Planned new capacity through 1955 is 2,304,000 tons over December, 1951.

Singletary Urges Support of Supts. Association at Penjerdel Meeting

Greater unity and greater support of the Superintendents Association by a direct appeal to the management of the industry was urged by Gordon Singletary, national president, as he addressed the annual fall meeting of the Pennsylvania-New Jersey-Delaware Division September 27. The two-day gathering,

attended by 272 members and guests, was staged at Galen Hall in Wernersville, Pa.

Mr. Singletary, superintendent at Brunswick Pulp & Paper Co., Brunswick, Ga., outlined the purpose of the Association and the proposed future for it. He stated that only by the successful operation of divisional meetings could the Association carry on its work.

Technical sessions were featured during the opening day. Co-chairmen of the morning program were George M. Suydam and Andrew J. Luettgen; of the afternoon meeting, Clarence F. Kingston and Mr. Suydam.

At the morning session J. J. Verwayen, plant engineer at Gibraltar Corrugated Paper Co., spoke on wastepaper stock cleaning and refining. On the program with Mr. Verwayen was O. P. Fussel, assistant superintendent at Lowe Paper Co., who presented a paper on "Cylinder Machine Operation."

Two papers were also read at the afternoon meeting. One, by Joseph J. Schwenkler, assistant superintendent at the folding carton division of Container Corp. of America, Manayunk, Pa., concerned "Meeting Current Trends in Board Specifications for Folding Cartons." The other paper was on the topic, "Superintendents' Non-mechanical Aids," and was presented by A. H. Haug, plant superintendent for Scott Paper Co. at Chester, Pa.

New officers

Election of officers for 1952-53 was held during the annual business meeting. The slate chosen is as follows: George M. Suydam, Riegel Paper Corp., chairman; Andrew J. Luettgen, P. H. Glatgelter Co., first vice chairman; Clarence F. Kingston, Hammermill Paper Co., second vice chairman; Cletus D. Coffman, Chesapeake Paperboard Co., third vice chairman, and Alfred M. Hartley, Nopco Chemical Co. Inc., secretary-treasurer.

A number of presentations were made at the dinner meeting on the second day. They included the awarding of a past chairman's certificate to Elmer Mitchell of Glassine Paper Co., retiring chairman; the presentation of a special award to John Dieffenderfer, division affiliate chairman, for the task of organizing and effecting the program covering the affiliates phase of the meeting, and the presentation of an engraved tray to Joseph Paciello, retiring secretary-treasurer.

Social events

In addition to a golf tournament, vaudeville show and dance, the entertainment included the annual P.P.P. show, under the direction of Alan Boyd of F. C. Huyck & Sons. Those in the cast included Jack Harper, Downingtown

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One Moving Element. Non-pulsating Vacuum.
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PRINCIPALS at the Michigan Division meeting included (l to r) Leon Mimms of Kalamazoo Paper Co.; John Vail of Dow Chemical Co., the speaker; Harvey Hartman of American Box Board Co., and Harrison Kindig of Mac Sim Bar Paper Co., who is secretary-treasurer of the division

Employee Relations Program Described at Michigan Supts.

How Dow Chemical Co. encourages its employees to study the free enterprise system and to compare it with other economic systems was described by John Vail at the October dinner meeting of the Michigan Division of the Superintendents Association. Mr. Vail is a member of the educational department of the Midland, Mich., plant of Dow Chemical.

In doing the job, he said, Dow has trained a group of discussion leaders to serve as moderators at small group meetings. Each employee may join one of these groups. The program covers three discussion periods, each of which is an hour and a half in length. The leaders are trained to serve as neutral moderators on any issue. Mr. Vail reported that the system has worked out to the benefit of all concerned.

The meeting, held at the Hotel Harris in Kalamazoo, was attended by 57 members and guests. Harvey Hartman of American Box Board Co., Grand Rapids, division chairman, presided. Mr. Vail was introduced by Leon H. Mimms of Kalamazoo Paper Co., first vice chairman.

Mfg. Co.; Bob Hohman, Shartle Bros. Machine Co.; Tony Schoettler, Reliance Electric Co.; Harry Holmes, The Lindsay Wire Weaving Co.; Joe Paciello, E. I. du Pont de Nemours & Co. Inc.; Don Hughes, R. T. Vanderbilt Co.; Al Hartley, Nopco Chemical Co.; Walt Brewer, also of Nopco; D. V. Vigneron, W. S. Tyler Co.; John Dieffenderfer, Hercules Powder Co.; Fred Lesser, Samuel M. Langston Co.; Ray Wilcox, Ray Wilcox Co., and Bob Greene, H. Waterbury & Sons Co.

Technical Section, CPPA, to Meet January 28-30

The 1953 annual meeting of the Technical Section, Canadian Pulp and Paper Association, will be held at the Sheraton-Mount Royal Hotel in Montreal January 28-30. Covering all phases of pulp and paper manufacture, the program will not only include subjects of interest to technical and research personnel, but will also contain material of interest to management and operators.

A feature of the meeting is the programming of a one-day session sponsored by the Fundamental Research Committee. This session will highlight three formal papers by industry research directors and a panel discussion on the industry's basic research problems. Representatives from Canadian universities and research councils will be present to take part in the discussion and to outline the work being done by their respective organizations.

Discussion groups will study the following subjects: drying and ventilating, electrical engineering, process instrumentation, board, and newsprint and mechanical pulping. Several other group discussions are planned, but arrangements are not as yet complete.

Pacific Coast Supts. Elect 1952-53 Officers

At the annual business meeting of the Pacific Coast Division of the Superintendents Association, which was held at the Empress Hotel in Victoria, B. C., the results of the election of 1952-53 officers were announced. The meeting was staged in conjunction with the 1952 Tri-Association Western International Meeting of the Pulp and Paper Industry.

New officers are as follows: Gus Ostenson, Crown-Zellerbach Corp. at Camas, Wash., chairman; William W. Clarke, Longview Fibre Co., Longview, Wash., first vice chairman; C. L. Walton, Simpson Logging Co., Shelton, Wash., second vice chairman; Max A. Bailey, Westminster Paper Co., Ltd., New Westminster, B. C., third vice chairman, and R. Burke Morden, Morden Machines Co., Portland, Ore., secretary-treasurer.

The other two association groups with which the Superintendents participated in the over-all joint meeting were the Pacific Coast Branch, Technical Section, Canadian Pulp and Paper Association, and the Pacific Section of Tappi.

Fifth Bolton Award Winners Announced

The names of the 13 prize winners in the Fifth Bolton Award Contest sponsored by the Superintendents Association has been announced. The winners will divide $3,250 in cash prizes contributed by John W. Bolton & Sons Inc., originators of the competition.

The prize essays are to be published in book form for free distribution by the Bolton firm. The subject in this year's contest was "Successful Selection of Supervisory Personnel." Names of the winners of the three first places are as follows: Hugh A. Black of The Mead Corp. at Chillicothe, Ohio, first prize ($1,000); William H. Chandler of S. D. Warren Co., Cumberland Mills, Maine, second prize ($750), and C. G. Krancher, Ball Bros. Co., Noblesville, Ind., third prize ($500).

Ten prizes of $100 each were awarded to the runners-up. They were Bemis P. Wood of West Springfield, Mass.; Lloyd E. Beck of Chillicothe, Ohio; R. Krause of Chicago; Robert L. Parks of Bellingham, Wash.; Charles L. Wright of Merchantville, N.J.; James L. Hill, Jr. of Cedarhurst, Md.; Alfred O. Mortenson of Cantonment, Fla., and Robert E. Kindler of Kaukauna, Wis.

Ohio Tappi Hears Talk by Dr. Van Den Akker on Color Measurement

The measurement of color was the subject of an address presented at the October 14 meeting of Ohio Tappi by Dr. J. A. Van Den Akker of the Institute of Paper Chemistry, Appleton, Wis. The meeting, which was held at Middletown, was attended by 149 members and guests.

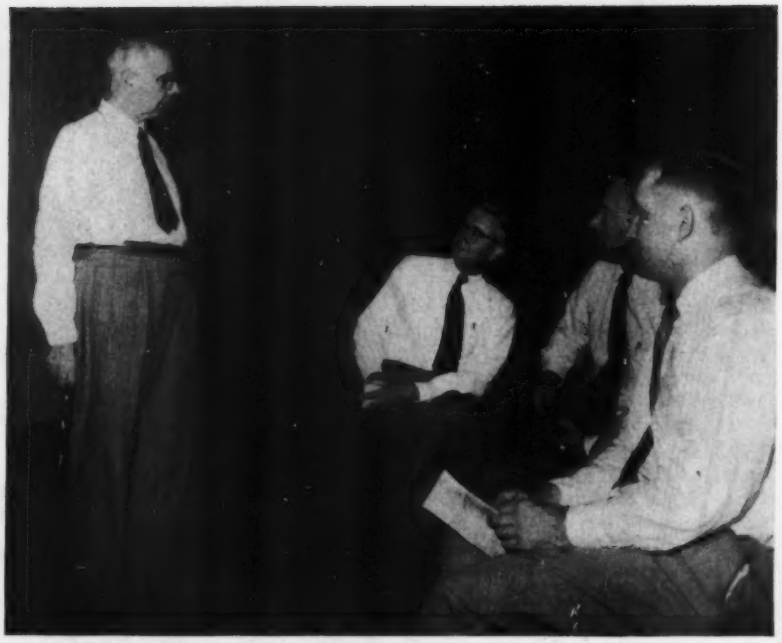
After reviewing the method for obtaining C.I.E. tristimulus values and trichromatic coefficients and the advantages of using a "standard observer," Dr. Van Den Akker declared that a color measuring instrument must be at least as meaningfully sensitive as the color vision of an experienced color matcher. The nature of the conditions prevailing in the matching of the color of paper are such that color matching can be done with considerably greater sensitivity for paper than for nearly all other materials. According to the speaker, "this is primarily because of the last three of the following five conditions: (1) A good level of illumination is pos-

APPLETON WOOLEN MILLS - *APPLETON, WIS.*

sible; (2) both eyes are employed in the viewing (binocular vision results in much greater sensitivity than monocular, the latter having been commonly employed in the old visual colorimeters); (3) in the color matching of paper the two fields under observation are separated by a very fine line (fineness of the line of separation of two fields has an important direct bearing on the ability of an observer to distinguish closely similar colors); (4) the viewed area is usually large (another factor making for good discrimination), and (5) most papers have flat, textureless surfaces."

In discussing the wide field of color measurement, Dr. Van den Akker classified color measuring instruments as (1) spectrophotometers and abridged spectrophotometers, and (2) three-filter colorimeters. The several sources of error of instruments of the first category were briefly discussed. This was also done for three-filter colorimeters, following a statement of the requirements of the spectral response of such instruments for each filter. Instruments in the second category, according to the speaker, are not of general value in the laboratory but are claimed to be useful in the rapid determination of tristimulus values and, therefore, of value in the control of color of industrial products. Dr. Van den Akker criticized two of the claims usually made for the instruments, viz., that (1) they are more sensitive than the eye, and (2) they will reliably measure color differences when the differences are small. He pointed out that the first claim is often invalidated by the failure of the second claim; color matches in the paper industry are often metameric and, in consequence, three-filter instruments will often yield incorrect data on the direction and magnitude of differences on the C.I.E. chromaticity diagram. At best, the speaker continued, a three-filter instrument is "color-blind," and the spectral responses of existing instruments corresponding to the three filters deviate sufficiently from the proper values to result in false data on color matching. For example, a really good match (to the eye) may be erroneously pronounced by a colorimeter as an unsatisfactory match; or, equally dangerous, an instrumental match may be unsatisfactory to the average normal eye.

In conclusion, Dr. Van den Akker declared that spectrophotometers (or suitable abridged spectrophotometers) are required in research and development laboratories; however, he added, there is a real need for reliable, yet relatively inexpensive, colorimeters (probably four-filter instruments) for the control of color in the mills.



ANSWERING QUESTIONS at the afternoon technical session of the Ohio Tappi meeting was Dr. Karl Freudenberg of Heidelberg University

Lignin Discussed by German Expert at Ohio Tappi

Lignin was the subject of two sessions of the September 15 meeting of the Ohio section of Tappi at Middletown. Speaker at both gatherings was Dr. Karl Fruedenberg of Heidelberg University, Heidelberg, Germany.

In the afternoon he conducted a round table for 30 organic chemists on the subject, "Research on Natural and Artificial Lignin and Its Constitution." At the evening session he addressed 96 members and guests on the topic, "The Formation of Lignin in Plant Tissues."

It was announced that the November 18 meeting would be at the American Legion Building in Middletown and would be a joint gathering with the Superintendents Association. The scheduled speaker is H. B. Thacker of the industrial engineering department of Westinghouse Electric Corp. He will speak on "Electric Distribution Systems."

GET-TOGETHER during the October meeting of Ohio Tappi included (l to r) Dr. J. A. Van Den Akker of the Institute of Paper Chemistry; Ed Barron, chairman of Ohio Tappi, and Ken Geohegan, national Tappi president

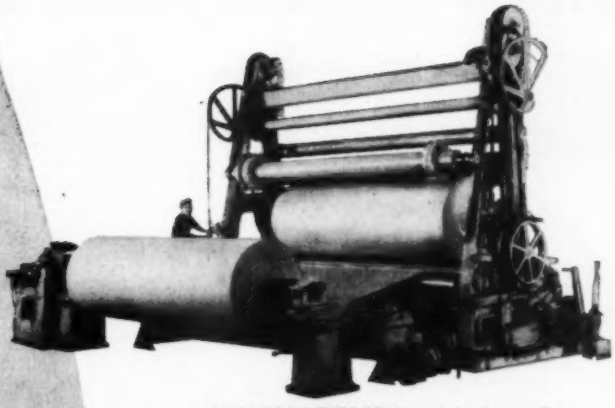
Joint November meeting of Milwaukee

The Corrugated Containers Committee and the Chicago section of Tappi held a two-day conference in Milwaukee November 20 and 21 at the Schroeder Hotel. The first day was devoted to papers and panel discussions, while on the second day the group visited the plants of Cornell Paperboard Products Co., Downing Box Co., and Gaylord Container Corp.

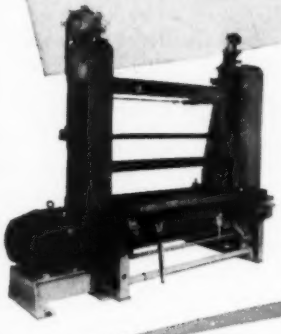
Highlighting the first day a resume of the industry survey on com-

Better Rolls

For two generations Camachines have set the top standards for quality in roll production. Every design feature of modern Camachines has been precisely engineered to help you produce rolls of finest quality . . . clean-cut, wrinkle-free and uniformly wound to the exact degree of "hardness" that you need. Camachine-made rolls stand up better in handling and shipping, and because of their uniform density they feed out with a smooth flow that means complete freedom from unwinding troubles. Ask your customers . . . they will tell you that Camachine-wound rolls are a better buy in every way!



CAMACHINE TYPE 19 One of the famous line of Camachine high-speed heavy-duty mill type winders.



CAMACHINE COMMANDER (Type 10). Popular heavy-duty slitter-rewinder for finishing rooms and converting plants.

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Camachine winders and slitters are built to keep downtime, repair and replacement costs at a minimum. Even when operating at Camachine's record-breaking speeds, vibration and consequent wear are virtually eliminated. And when normal wear calls for replacements Camachine's trained service department stands ready to speed the shipment of new parts. Ask your maintenance men and they will tell you why Camachines stay on the job!

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Camachine slitters and winders are easier on the operator. Simplified controls, handy facilities for accurate adjustments, and other important operating and safety features mean greater production with less operator fatigue. Camachine engineering developments of advanced design provide for faster starts, smoother braking and quicker roll changes. Easy accessibility and precision fittings make routine maintenance speedy and efficient. When you ask experienced operators they'll tell you it's Camachine for them, every time!

Camachine engineers will be happy to consult with you regarding fast, low cost production, of top-quality rolls.

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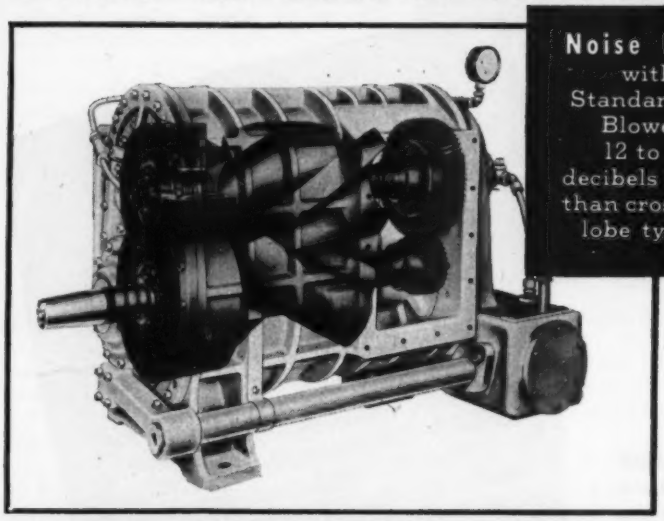

Noise Level with Standardaire Blowers 12 to 18 decibels lower than crossflow lobe types.

STANDARDAIRE QUIETNESS MEANS LESS WEAR--MORE AIR

IMPARTIAL tests have proved conclusively that Standardaire Blowers with their smooth, gradual delivery action minimize shock and sound pulsations . . . a distinct contribution to quiet operation. Then too, the noise level does not noticeably increase with higher pressures. With the Standardaire principle you squeeze the air gently instead of slapping it . . . a feature that eliminates shock load on the internal parts of the blower. This, of course, means less wear and prolongs service life, even under severe operating conditions.

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bining was made by the Corrugated Containers Committee. Presenting the analysis was H. T. Scordas of Union Bag & Paper Corp.

Five other panel speakers presented papers on corrugating problems. V. V. Vallandigham of Potlatch Forest Industries discussed "Problem Analysis;" C. R. Vander Meulen of Penick & Ford spoke on "Warping and Washboarding;" F. E. Skiver of American Boxboard Co. talked on "High-Low Corrugations;" A. F. Sperling of Downing Box discussed "Corrugator Delivery Tables," and K. W. Max of Robert Gair Co. presented a paper titled, "An Operator Designs a Corrugator." Acting as moderator was W. R. Tobin of American Boxboard.

CPPA Technical Section's midwest branch has elected R. I. Jorgenson of Great Lakes Paper Co. Ltd., Toronto, chairman for the 1952-53 season. Herman McLenaghen of Abitibi Power & Paper Co. Ltd. was named vice chairman; R. E. Lee of Great Lakes Paper is the new secretary-treasurer.

Coming Events

TAPPI meetings

Dec. 12—Lake Erie Section, Christmas party, Hotel Carter, Cleveland.

Dec. 15—Chicago Section, Christmas party, Chicago Bar Association, Chicago.

Jan. 13—Pacific Section, "Routine Control Methods," Seattle.

Feb. 16-19—Annual meeting, Commodore Hotel, New York, N. Y.

American Pulp & Paper Mill Superintendents Association meetings

Dec. 18—Michigan Division, Hotel Harris, Kalamazoo.

Jan. 15—Michigan Division, Hotel Harris, Kalamazoo.

Jan. 22—Miami Valley Division, place to be announced.

June 9-11—National meeting, Atlanta-Biltmore Hotel, Atlanta, Ga.

Other meetings

Jan. 8-9—Midwest Research Institute (in cooperation with engineering societies), Symposium on Automatic Computing Equipment in Industry, Kansas City, Mo.

Jan. 19-22—Plant Maintenance Conference, Public Auditorium, Cleveland.

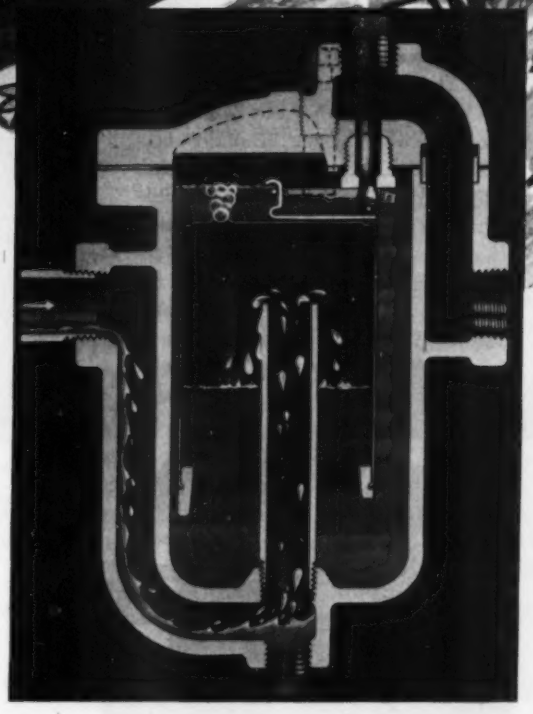
Jan. 26-30—Dr. John Gaillard Seminar on Industrial Standardization, Engineering Societies Building, New York, N. Y.

Jan. 26-30 — Eleventh International Heating and Ventilating Exposition, International Amphitheatre, Chicago.

Jan. 28-30—CPPA Technical Section, Mount Royal Hotel, Montreal.

Feb. 15-20—APPA, annual meeting, Waldorf-Astoria Hotel, New York, N. Y.

Steam Traps & Ground Hogs



THERE IS some reason to doubt that the ground hog comes out of his hole every year on February 2, to look for his shadow in order to find out when spring will arrive.

The story is an entertaining bit of folklore that the newspapers keep alive for the fun of it.

There is a bit of folklore about steam traps for paper machine drainage, too. You hear things like this:

1. There are no traps to handle air fast enough.
2. There are none to handle condensate fast enough.
3. There are none that will last long enough.

This folklore isn't true, either. Armstrong Paper Machine Dryer traps answer all these objections very nicely.

Item 1—air venting—Armstrong paper machine traps have over-sized bucket vents sized specially for each dryer, to vent air FAST.

Item 2—condensate capacity—Armstrong paper machine traps, like all Armstrong traps, discharge condensate as fast as it reaches the trap—at steam temperature. There are traps for the largest as well as the smallest paper machine dryers.

Item 3—trap life—Armstrong paper machine traps have stabilizing tubes which eliminate excessive agitation of the buckets, thereby minimizing wear of parts. All parts are made of corrosion and wear-resistant stainless steel except the valve and seat which are chrome steel, hardened, ground and lapped. The result is *long life with low maintenance.*

Send for Bulletin No. 205

The benefits of Armstrong traps for draining paper machine dryers are explained in more detail in this bulletin. You are welcome to a copy. Write to:

ARMSTRONG MACHINE WORKS

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Inverted Bucket Steam Traps • Paper Machine Moisture Controls and Individual Dryer Temperature Controls

"Buffalo"

Tips on Getting Best Results With FANS

In The Induced Draft Fan, It's

EASE of MAINTENANCE that Counts

. . . or to put it another way, the cheapest mechanical draft fan is the one which is easiest to maintain throughout the years. And, since induced draft is one of the most severe services for a fan, this calls for strength plus accessibility. And for the especially punishing service of induced draft, "Buffalo" provides wearing strips welded on the blades where necessary—and when spots become worn they can be built up again with weld metal. "Buffalo" Sectional, bolted housing construction makes every part of the fan accessible for inspections and repairs. "Buffalo" self-aligning water cooled bearings are husky with babbitted shoulders for thrust collars—conveniently removable liners too! Thus, "Buffalo" Induced Draft Fans save you money where it counts—in maintenance over the years.

STRENGTH PLUS ACCESSIBILITY!

Above, "Buffalo" Induced Draft Housing. Note heavy plate construction, quick-latching access doors, sectional bolted design, inlet guide vanes that minimize erosion.

LONG LIFE CONSTRUCTION

is evident in heavy-duty double width induced draft rotor (at left). All welded with no tierods. Efficient modified radial blades. Floor plate wearing strips with angular ridges to reduce erosion.

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The Paper Industry Names in the News

Kelly Gets New Marathon Post

In a realignment of the plant managerships of Marathon Corp., *ROY H. KELLY* has been appointed to the newly established position of chief paper mill superintendent.

The appointment was announced by W. H. Graebner, chief mill manager for the corporation, who said that Mr. Kelly will be succeeded as resident manager of the Rothschild, Wis., plant by *CHARLES L. WAGNER*, present manager of the waxed paper plant and mill at Menasha. Succeeding Mr. Wagner at Menasha will be *JOHN W. FITZPATRICK*.

Roy H. Kelly

J. F. Stevenson

Stevenson Manages Mead's Wheelwright Mill

JAMES F. STEVENSON has been made division manager of the Wheelwright Division of Mead Corp. at Leominster, Mass.

Mr. Stevenson joined the company in 1943 as a research and development engineer at Chillicothe, Ohio. In 1949 he became assistant to the director of corporation technical service, and for the past year and a half he has been assistant director of research, development, and corporation technical service.

A native of Grove City, Pa., he received his chemical engineering degree from Grove City College in 1942. He is a member of the Semi-Chemical Pulping Committee of TAPPI.

McCowan, Entomologist, Joins Weyerhaeuser

VAUGHAN F. McCOWAN has joined Weyerhaeuser Timber Co. as entomologist in the firm's forestry research office at Centralia, Wash. He will spend considerable time in the field studying the characteristics and habits of insects found on the company's tree farms in western Washington and Oregon and will work cooperatively with the forest insect laboratory of the U. S. bureau of entomology, Portland, Ore., to develop effective and practical control measures.

Born and raised in Portland, Me., Mr. McCowan graduated from the University of Maine school of forestry in 1951 and received his master's degree in entomology and forestry at the University of Michigan in June 1952, joining Weyerhaeuser timber organization the following month.

V. F. McCowan

A. Carswell

A. CARSWELL, a vice president and general sales manager of the St. Regis Paper Co.'s multiwall bag division, was recently elected to fill a vacancy on the board of directors. He joined the company in 1928 and was named a vice president in 1949.

Escanaba Announces Personnel Changes

STANLEY LEISHMAN, plant superintendent of Escanaba Paper Co., Escanaba, Mich., for the past four years, has accepted a position as general superintendent of Provincial Paper Co. Ltd., Thorold, Ont. *DON ESTEBO*, assistant division engineer since 1947, has joined the Wheelwright Division of Mead Corp. at Leominster, Mass., as division engineer.

Five promotions in the management staff are as follows: *JOHN ARNOLD*, assistant to the paper mill superintendent, to assistant to the management; *O. C. CHRISTIANSEN*, assistant to the plant engineer, to paper mill superintendent, succeeding Mr. Leishman; *CLARK GREENLES*, paper mill day foreman, to assistant paper mill superintendent; *GEORGE CHAMPLEY*, paper mill tour foreman, to paper mill day foreman, replacing Mr. Greenles, and *HENRY ABEL* to paper mill tour foreman, replacing Mr. Champley.

JOSEPH J. KELLEY, who has been associated with United States Gypsum Co. for the past 35 years, has been named assistant to the president of Pabco Products, Inc., with headquarters in San Francisco. He recently had been manager of the paper procurement division for the seven major felt and paper mills of U. S. Gypsum.

R. E. Bundy

M. E. Sanford

R. E. BUNDY, vice president in charge of production, Fibreboard Products Inc., has been appointed executive vice president. *M. E. SANFORD*, general production manager, replaces Mr. Bundy as vice president in charge of production.

J. D. MALCOLMSON, of Robert Gair Co. Inc., was elected a member of the board of directors of Packaging Institute at their forum held recently in New York City. *F. S. LEINBACH* of Riegel Paper Corp., was re-elected vice president of the Institute.

Wisconsin Names Harrington Acting State Forester

C. L. (NEIL) HARRINGTON was recently named acting state forester by the state conservation commission at Madison, Wis.

Mr. Harrington has been with the conservation department since 1912 and has been superintendent of forests and parks since 1927. His appointment was

made in accordance with the recent reorganization of the conservation department's forestry divisions. In addition to forests and parks, Mr. Harrington will be head of cooperative forestry (working with private forest interests) and forest protection.

Born in Hurley, Wis., Mr. Harrington attended the University of Wisconsin and received a forestry degree from the University of Michigan.

JOHN MARTINOVICH, assistant superintendent of the Thomson, N. Y., mill of United Board & Carton Corp., since 1950, has been appointed acting superintendent. He has been associated with the company since 1930, when he started as a stock handler.

John Martinovich

F. W. Saco

FELIX W. SACO has been appointed mechanical development engineer at Permutit Co., New York City, where he will work on the design of all applications of ion exchange materials and techniques in the treatment of water and other liquids.

Three Added to Mando Staff

Three additions have been made to Minnesota & Ontario Paper Co.'s engineering and research staffs at the firm's International Falls pulp, paper and insulation board mill. *CARROLL M. THUREEN* has been appointed research chemist; *WARREN T. PETERSON,* project engineer; and *ERNEST R. GUSTAFSON,* hydraulic engineer.

Mr. Thureen, who is studying for his master's degree in wood technology at the University of Minnesota, will work in the paper research section of the laboratory. Mr. Peterson is also completing work on his master's degree in mechanical engineering at the University of Minnesota. He worked for three and one-half years at the university's engineering experimental station as a laboratory technician. In this capacity, he was the project leader on experiments dealing with building material and insulation board. Mr. Gustafson, a graduate of Michigan College of Mines, has worked for U.S. Army Engineers at Duluth, Minn., for the past 26 years. He headed the operation of the division of hydraulic and water power. In his new job he will have responsibility for hydraulic and hydro electrical engineering under the supervision of Chief Engineer, J. H. Davidson.

Francis Eyre Named Chief of Forest Management Research

FRANCIS H. EYRE, of the Lake States Forest Experiment Station, St. Paul, Minn., has been named chief of the Division of Forest Management Research in Washington, D.C. He succeeds *LEONARD I. BARRETT,* who has been named director of the Timber Resource Review project of the Forest Service. In his new position, Mr. Eyre will coordinate research on growing and handling timber on forest lands conducted at 11 forest experiment stations in the United States, Puerto Rico, and Alaska.

For the past 13 years he has been chief of the Division of Forest Management Research at the Lake States Station. He is author of some 25 scientific articles concerning forestry in the Lake States. Prior to his assignment to the Lake States Experiment Station in 1931, he served on western national forests in various capacities, including timber cruiser and assistant forest supervisor, and in the office of forest experiment stations in Washington, D.C.

Three New Positions Created at American Cyanamid

Three new positions have been created in the Paper Chemical Department of American Cyanamid Co.

A. C. BATE, formerly New England district manager for Industrial Chemicals Division, was named eastern regional manager. He will supervise sales of all paper chemicals in an area which includes New England and other Atlantic Seaboard states extending as far south as the west part of Virginia. He will headquarter in Boston. *K. E. YOUNGCHILD,* formerly product supervisor of paper resins in New York, was named southern regional manager with headquarters in Mobile, Ala. He will supervise chemical sales in an area extending from Richmond, Va., to and including Texas and Oklahoma. *GEORGE E. FROMM,* formerly product supervisor of wax and rosin sizes in New York, was named western regional manager, with headquarters in Chicago. He will supervise all Middle West and western sales.

JOSEPH E. O'BRIEN has been named director of purchases of Ohio Boxboard Co., Rittman, Ohio, succeeding *R. G. HAGEY,* who will devote full time to wastepaper procurement as president of Ohio Boxboard's wastepaper company subsidiaries. Four new directors are: *C. B. McDONALD,* of McDonald & Co., Cleveland; *FRAN-*

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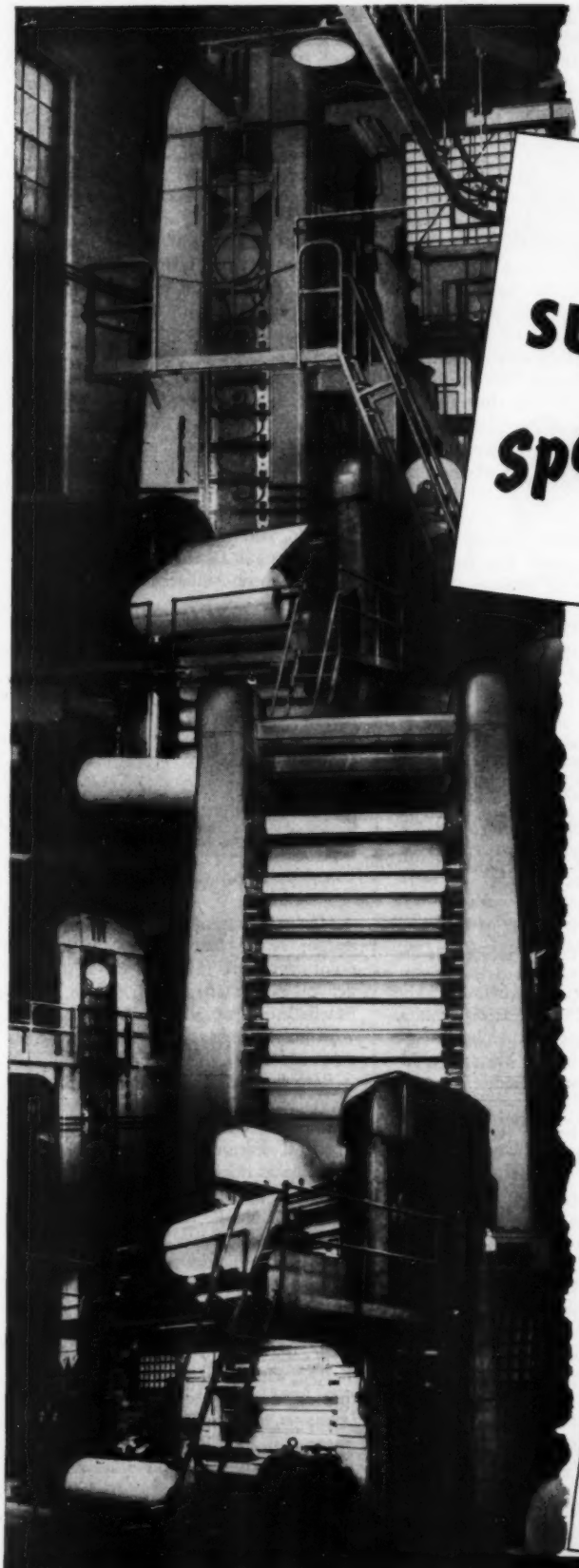

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BAY CITY, MICHIGAN

CIS H. BEAM, of The National City Bank of Cleveland; *DUDLEY W. MAXON,* of Wise, Roetzel, Maxon, Kelly & Andress, Akron; and *M. E. BARTHEN,* administrative vice president of Ohio Boxboard.

Two promotions have been announced by Gardner Board & Carton Co., Middletown and Lockland, Ohio. *RAY FIELDS* has been named a beater foreman in the Lockland board mill, and *NORMAN OHLER* has been made a staff assistant in the finance department.

WILLIAM S. BUZZARD, assistant pulp mill superintendent for West Virginia Pulp & Paper Co. for the past five years at their Williamsburg, Pa., mill, has joined the Fischer & Porter Co.'s pulp and paper application engineering staff.

JOHN F. HOOPER, associated for the past 12 years with Rayonier Research Laboratories at Shelton, Wash., has been appointed chief chemist of the Jesup division of Rayonier Inc. In his new position, Mr. Hooper will be head of technical control operations.

W. R. CRUTE, division manager of Champion Paper & Fibre Co.'s Texas operations at Houston, has been elected vice president of the company. He has been with the firm since 1917, when he was employed at the Canton, N. C., plant as superintendent of power. Mr. Crute was made manager of the Houston plant in 1937 when it was built, and division manager of the company's Texas operations in 1946.

DOUGLAS MORRISSEY, of the Thilmany Pulp & Paper Co., Kaukauna, Wis., has been elected a member of the board of directors of the Wisconsin Industrial Editors Association.

WALTER F. O'CONNELL has been appointed assistant to John W. Hanes, vice president for southern operations of Olin Industries, Inc., in the administration of Ecusta Paper, Olin Cellophane and Forest Products Divisions. Mr. O'Connell, a director of Interstate Natural Gas Co., formerly operated his own tax and financial consulting firm in Greensboro, N.C., devoting considerable time to southern operations of Olin Industries.

Hercules Powder Co., Wilmington, Del., has announced the following personnel changes. *MILTON J. MAGUIRE,* district sales manager of the paper makers chemical department at Portland, Ore., will retire December 31. He will be succeeded by *HOKE MARTIN,* manager of the company's Kalamazoo, Mich., sales office. Mr. Maguire expects to act as sales agent for paper industry products on the West Coast. *DANIEL D. CAMERON,* assistant manager of technical service, PMC department, Wilmington, has been named district sales manager at Kalamazoo, and *ROBERT R. BUSS* has been named assistant district sales manager at Kalamazoo.

EDGAR ANDREWS has been named paper industry manager by Minneapolis-Honeywell Regulator Co. He has been industrial manager of the firm's Jacksonville, Fla., office and for the past five years has handled paper industry accounts in the Southeast. Headquartering in the Philadelphia office, he succeeds *HAROLD SHOLL.*

CHARLES W. BATTLE has been appointed vice president and general manager of General Cellulose Inc. For the past ten years, he has been associated with Personal Products Corp., a Johnson & Johnson affiliated company.

C. W. Battle

W. B. Reese

Macbeth Corp. and subsidiaries, Newburgh, N.Y., has announced the appointment of *WARREN B. REESE* as general sales manager. Mr. Reese joined Macbeth in 1950 and has been occupied with solving industrial color problems.

ROE S. CLARK has been elected president of Package Machinery Co. at Springfield, Mass. He succeeds Roger L. Putnam, economic stabilizer, who will continue as board chairman.

NORMAN R. MAIER has been appointed a sales application engineer to the Boston district sales office of Reliance Electric & Engineering Co. He has been with the firm since 1950.

W. ROGER STOLL, formerly connected with the sale of vinyl products, has been appointed West Coast sales manager for the electrochemicals department of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

CLINTON F. ROBINSON has been elected president of Carborundum Co., Niagara Falls, N.Y., to succeed H. K. Clark, resigned. *PAUL B. BROWN, CLARENCE E. HAWKE,* and *WIL-*

LIAM H. WENDEL, formerly managers of the Bonded Products and Grain Division, Refractories Division, and Coated Products Division, respectively, were elected vice presidents in charge of these divisions.

D. S. DENMAN, vice president of Crown Zellerbach Corp., has been elected a director of Fibreboard Products Inc. He replaces *R. A. McDONALD,* vice president and chairman of the executive committee of Crown Zellerbach, who has taken a leave of absence to serve as assistant administrator in charge of industrial and agricultural equipment of the NPA.

The following men have accepted chairmanships of various divisions of the 1952 Fund Raising Drive of the Travelers Aid Society of New York: *NORMAN F. GREENWAY,* vice president, Robert Gair & Co., Inc., Carton Manufacturers Division; *JAMES F. LEVENS,* president, George W. Millar & Co., Inc., Wrapping Paper Division; *THOMAS A. MAGEE,* president of Gray Envelope Mfg. Co., Inc., Envelope Manufacturers Division; *JOHN A. DINOIA,* Modena Paper Mills, Paper Manufacturers Division; *J. O. BULKLEY,* Bulkley, Dunton & Co., and *JOHN M. MANGIERI,* Pulpaper Co., co-chairmen, Fine Paper Division.

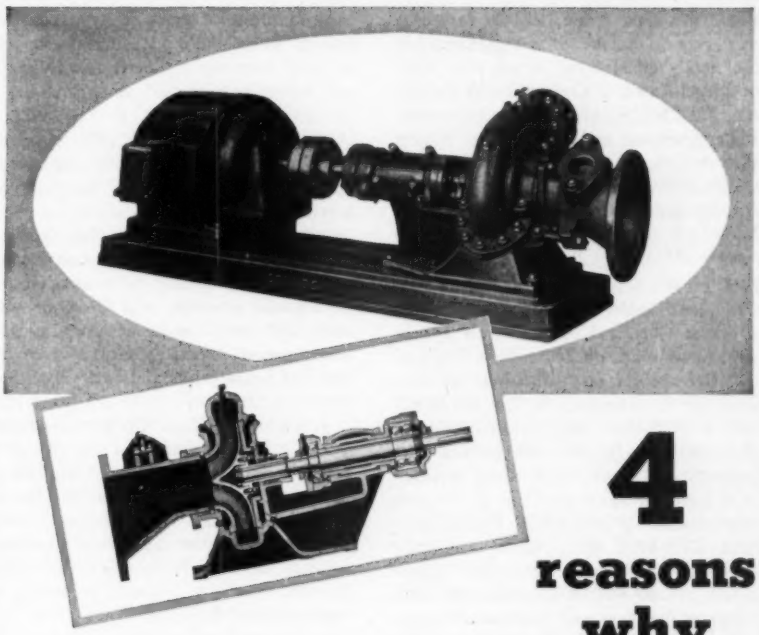
L. H. SCHOENHOFEN, general manager of eastern operations of Container Corp. of America, has been elected a vice president.

R. B. REID has resigned as purchasing agent of Brown Co., Berlin, N.H.

Marathon Corp. has announced the transfer of personnel supervisor *HOWARD H. ADERHOLD* from Menominee, Mich., to the firm's general headquarters at Menasha, Wis., and the appointment of *GLEN J. BERTAGNOLI* as his successor at Menominee. Associated with Marathon since 1934, Mr. Aderhold will become a member of the firm's staff personnel division. Mr. Bertagnoli has been a job analyst in Marathon's central wage and hours department since 1951.

Ball Bros. Co., Muncie, Ind., has advanced *BURNHAM B. HOLMES,* general manager of paper since 1951, to general manager of paper, purchasing and traffic, and has named *GEORGE H. McGOWAN,* formerly assistant general purchasing agent of Anchor Hocking Glass Corp., to a newly created managership of the Paper Products division.

JAMES D. RHODES has been appointed division engineer of Frost Lumber Industries division of Olin Indus-



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1. ***Positive even flow.*** **The inlet tips of impeller vanes are warped to give a screw conveyor effect which insures an even flow and prevents water separation of the paper stock.**

2. ***No jamming.*** **Ejector vanes follow curvature of main vanes of impeller, preventing entrance and jamming of stock or other solid material between back impeller wall and stationary wearing plate.**

3. ***Easy to adjust for wear.*** **Shaft and impeller can be moved axially toward suction side plate to take up wear due to abrasives in material handled.**

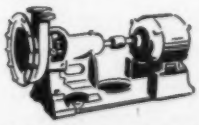
4. ***Easy to inspect and maintain.*** **You can inspect or renew rotating element without disturbing bearing assembly. Ample washout connections at top and bottom of casing. Stuffing box readily accessible and stuffing box gland easily removable.**

Goulds centrifugal stock pumps are especially designed for efficient handling of paper stock of all kinds and consistencies in mills of all types.

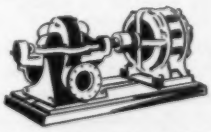
The heavy duty unit (Fig. 3105) illustrated above will deliver up to 4000 G.P.M. Heads up to 220 ft. Available in 4″, 6″, and 8″ sizes. For detailed information, complete specifications, write for Bulletin 723.1.

Other GOULDS PUMPS for Pulp and Paper Mills

This rugged vertical centrifugal stock pump (3115) requires minimum floor space. Available in capacities 150 to 2000 G.P.M. Heads up to 180 ft.



Stainless steel pump for handling acid and alkaline liquors. Capacities up to 600 G.P.M. Heads up to 160 ft. (3705).



For capacities up to 15,000 G.P.M. Heads up to 500 ft. Check the specifications of this Goulds ball bearing double suction centrifugal (3450).

MEMBER

Goulds PUMPS INC. Seneca Falls New York

tries, Inc., East Alton, Ill. He formerly was superintendent of maintenance at the newly constructed wood pulp mill of Riegel-Carolina Corp., near Wilmington, N.C. Mr. Rhodes will be responsible for engineering and maintenance of the saw mills and related operations of Olin's Forest Products division. At present, his headquarters are at Shreveport, La.

The consolidation of the Boston and Providence sales organizations of the Dyes & Chemical division into a new organization known as the New England District was recently announced by E. I. du Pont de Nemours & Co. *ROBERT R. FARWELL and HAROLD L. SAGER*, manager and assistant manager respectively of the Providence district, will have the same positions in the new organization. *WALTER H. ZILLESSEN* and *GEORGE H. SMITH*, formerly manager and assistant manager respectively of the Boston District, will continue as manager and assistant manager of the New England district of the Rubber Chemicals division.

WILLIAM SHINNICK, of Springfield Pike, Glendale, Ohio, has been promoted to junior industrial engineer of Gardner Board & Carton Co., Middletown and Lockland, Ohio. He joined Gardner in 1950 as a management trainee.

ROBERT L. MULLIGAN has retired from his position as yard foreman for Racquette River Paper Co., Potsdam, N.Y., after 41 years of continuous service.

C. LONGFORD FELSKE, of Chicago, was to have become vice president of Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich., in charge of finance, about October 15. Mr. Felske previously was vice president of Harris, Hall & Co., a brokerage and securities concern with which he has been affiliated for the last 16 years.

CLINTON L. WHITTEMORE, JR., of St. Louis, has joined the administrative staff of Olin Industries, Inc., as a special representative on all activities of the company.

Three promotions have been made at the Hamilton division of Champion Paper & Fibre Co. *W. A. TAYLOR* has been made general superintendent of the coating mill; *LEO J. ROSE* has been named assistant general superintendent, and *WILLIAM VANOVER* has been made night superintendent.

ERNEST NUSPLIGER has been appointed executive vice president and general manager of J. P. Lewis Co., manufacturer of specialty boards, at Beaver Falls, N.Y. He has been associated with the company for 43 years and formerly was mill manager.

W. RIDGELY CHAPLINE, chief of the Forest Service's division of range research, has retired after 40 years of service. He has accepted a position with the Food and Agriculture Organization of the United Nations as a range consultant in the forestry division at Rome. In his new position, Mr. Chapline will deal with world-wide activities in the conservation, improvement and management of range lands.

JACKSON KEMPER has been appointed general manager of Watson-Stillman Fittings Division, H. K. Porter Co. Inc., Roselle, N.J. He will be responsible for all operating and sales activities of the division, formerly known as the Watson-Stillman Distributor Products Division, of which he was sales head.

TATE M. ROBERTSON, JR., has been appointed sales manager of the corn products department of Anheuser-Busch Inc.

T. M. Robertson

R. E. Small

RUDY E. SMALL has been promoted to sales manager of Paper Converting Machine Co., Green Bay, Wis. He joined the firm in 1947, and prior to that was with the engineering department of Northern Paper mills.

STANTON MEAD, president of Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis., has been appointed an industry member of the Fair Employment Advisory Committee, which aids the Industrial Commission in administering the Wisconsin Fair Employment Law.

Fairbanks, Morse & Co. have announced the following changes in personnel. *W. E. WATSON*, manager of the pump manufacturing division, has been promoted to assistant to the manager of manufacturing, with headquarters in Chicago. *PAUL R. FLOOD*, manager of manufacturing of the company's Beloit, Wis., Works, has been transferred to Pomona, Calif., where he has been appointed general manager of the company's Pomona Pump Works, succeeding *CHARLES L. BARRETT*, who has become a consultant to the Pump Division. *LEWIS H. KESSLER* has been named chief hydraulic engineer at the Beloit Works. He succeeds *R. C. GLAZEBROOK* who has been on special assignment to the general manager with duties relating to the new Fairbanks-Morse plant now under construction in Kansas City, Mo. *ROBERT B. CRAIG*, formerly R.E.A. deputy administrator and Diesel Engine Manufacturers Association representative, has been appointed assistant to the president, working on special assignment. His headquarters are in the Washington office. *S. L. FRY*, formerly manager of the company's Omaha branch diesel department, has been appointed assistant manager of the Pump Sales Division, with headquarters in Chicago.

CECIL L. HESS, a graduate of Montana State College and the Institute of Paper Chemistry, has joined the research department of Minnesota & Ontario Paper Co., International Falls, Minn. His work will deal with pulp and by-product research.

HOWARD TIMMS, general manager of Harnischfeger Corp., Escanaba, Mich., has resigned. He will be succeeded by *ROBERT O. LOSSE*, who formerly was general superintendent of the company's operations in Milwaukee. He has been associated with the company for 17 years.

HOWARD DITMYER has been promoted to tour foreman at Mill II of Gardner Board & Carton Co., Middletown, Ohio. For the past year he has been a management trainee and has been taking training courses.

DONALD B. KIPP, member of the law firm of Pitney, Hardin & Ward, Newark, N.J., has been elected a director of American Can Co.

JOHN RINGLEB, head of the traffic department of Kimberly-Clark Corp., Niagara Falls, N.Y., who has been promoted and transferred to the company's main offices at Neenah, Wis., was honored recently at a dinner meeting of the Freight Traffic committee of the Niagara Falls Chamber of Commerce. Mr. Ringleb is vice chairman of this committee.

SAMUEL E. CROCKER JR. has been appointed sales manager of the Bolton and Emerson divisions of John W. Bolton & Sons Inc.

DR. M. H. BIGELOW, technical director of the Plaskon division of Libbey-

Owens-Ford Glass Co., has been named a director-at-large of the Armed Forces Chemical Association and secretary of the Great Lakes section of Forest Products Research Society.

OSCAR P. COHEN has been made a group leader in the research and development department of Monsanto Chemical Co.'s Merrimac division. He will be responsible for research and development of papermaking chemicals. Mr. Cohen joined Monsanto as a research chemist in 1946.

FRED W. SCOTT JR. has been appointed manager of the newly established merchandising sales division of Carborundum Co., Niagara Falls, N.Y.

The Naugatuck Chemical Division, United States Rubber Co., has announced that *LAWRENCE W. WIDDECOMBE JR.* and *HAROLD SPECTOR* have joined the collodial products devlopment section. Mr. Widdecombe will have charge of the paint laboratory, supervising research and technical service work on latex paints. Mr. Spector will direct the division's paper laboratory, supervising resarch on applications of plastic latices in the paper industry.

J. M. DOUGLAS has been named valve sales manager of the central region for Minneapolis-Honeywell Regulator Co., Philadelphia, Pa. Mr. Douglas has served in industrial sales activities in the company's Syracuse, Albany and New York City branches. He will make his headquarters at the Cleveland branch office.

Lewis-Shepard Products Inc. has announced the appointment of *RAYMOND F. PURINTON* as sales and service representative in the Denver, Colo., territory, which includes all of Colorado, Wyoming and part of Southwestern Nebraska, and *RICHARD S. STOCKWELL* as sales and service representative in the Minneapolis-St. Paul territory, which includes all of Minnesota and part of Wisconsin.

HERBERT F. ZIEGLER JR. has been appointed manager of the Kansas City, Mo., district office of Sterling Electric Motors, Inc.

C. L. PETERSON has been appointed general sales maanger of the Industrial Division of Minneapolis-Honeywell Regulator Co. at Philadelphia, Pa. Mr. Peterson has been regional manager for Honeywell's midwest region in Chicago since January 1950. He succeeds W. H. Steinkamp.

LLOYD J. BOHAN, Los Angeles, Calif., has been appointed sales representative in Southern California and Nevada for Michigan Steel Casting Co., Detroit.

LOUIS T. KIMPLE has been elected assistant vice president and general manager of the Dallas Division of Dixie Wax Paper Co.

PAT REITEN has been appointed general safety supervisor for the Washington and California plants of Simpson Logging Co., Shelton, Wash. He formerly was chief of safety education for the State Department of Labor and Industries and recently was elected secretary of the Western Forest Products Safety Conference.

Electric Machinery Mfg. Co., Minneapolis, Minn., has announced the appointment of *W. R. SHOOK* as manager of the new Southeast district office at Atlanta, Ga.

J. HOWARD WRIGHT has been appointed sales engineering representative of Bauer Bros. Co., Springfield, Ohio, in Pennsylvania, New Jersey, and Delaware, with headquarters at Downingtown, Pa.

J. H. Wright

Dr. C. G. Caldwell

DR. CARLYLE G. CALDWELL has been elected an assistant vice president of National Starch Products Inc. He joined National's research staff in 1940, and he has been research director since 1948.

L. V. WALLS of Jackson, Miss., has been elected president of the Forestry Conservation Communications Association. He succeeds H. J. McGinnis of Tomahawk, Wis. Mr. McGinnis is chief of the electrical section of the Engineering Division of the Wisconsin Conservation Department.

WILLIAM E. LEVIS, a director of Owens-Illinois Glass Co., Toledo, has been elected a director of Robert Gair Co. Inc., replacing Henry J. Sargent, retired.

W. STUART LANDES has retired as vice president of the plastics division of Celanese Corp., Newark, N. J. He is to be succeeded by *DR. LEOPOLD ECKLER*, who was formerly in charge of technical control. Dr. Eckler will have the title of general manager.

Hercules Powder Co. has announced the appointment of *WERNER C. BROWN* as an assistant director of sales for its cellulose products department. He has been supervisor of CMC sales. *A. R. OLSEN* will become manager of CMC sales, succeeding Mr. Brown, while *J. B. MARTIN* will replace Mr. Olsen as manager of molding powder sales in the cellulose products department.

JOHN A. DOWNES, Philadelphia mill representative for Stocker Mfg. Co. for the past five years, has resigned to become sales manager for Crowell Corp. of Yorklyn, Del., manufacturers of all types of paper and cloth tapes.

MERRILL POLLARD, National Gypsum Co., Buffalo, has been elected to the board of directors of the Western New York Safety Conference.

Gardner Board & Carton Co., Lockland, Ohio, has promoted two veteran employees. *WILLIAM OLIVER* has been made safety supervisor for all company plants, and *RICHARD BURBANK* has been promoted to succeed Mr. Oliver at Lockland.

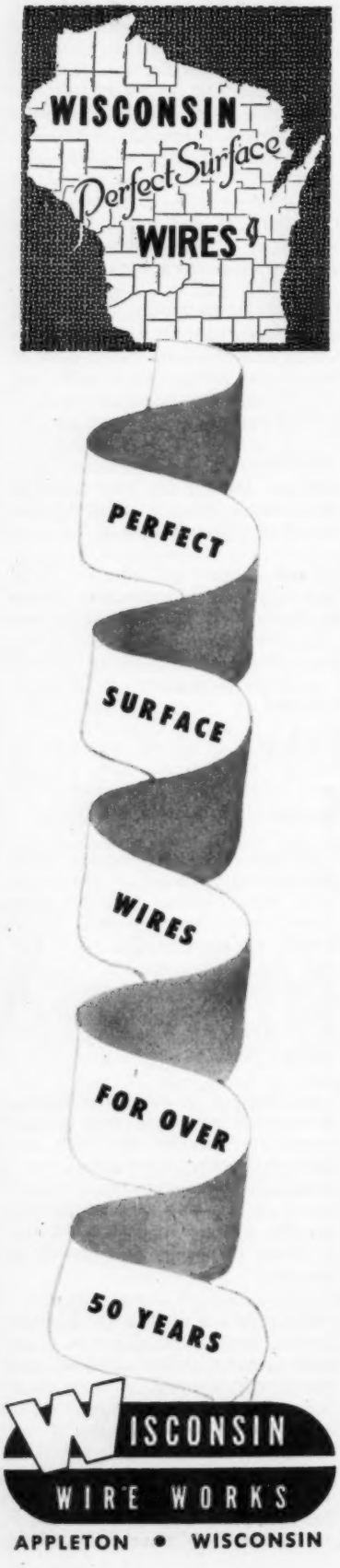
ROBERT BENSON, assistant sales manager for industrial sales, has been made assistant sales manager of Omega Machine Co., Providence, R.I.

A. RONALD TRIST has been elected chairman of the board of directors of Trist Paper Coatings Inc., Worcester, Mass. Named president was *ELI de VRIES*; vice president, *DAVID H. FINNIE*, and secretary-treasurer, *CHARLES SUMNER BARTON*. Members of the board of directors are *ROBERT S. BOWDITCH*, Mr. Barton, Mr. de Vries, and Mr. Finnie.

GEORGE A. SCHRYER of Bathurst Power & Paper Co. has been reelected president of the New Brunswick Accident Prevention Association. Among other executive officers chosen recently are A. A. Chisholm, also of Bathurst, first vice president, and D. A. McAlary of Fraser Companies Ltd., second vice president.

CHARLES A. CARLSON JR., since 1949 company representative on government contracts, has been appointed assistant district manager of sales in the New York area for Lukens Steel Co. He will headquarter in Albany.

GORDON VAN BUREN, San Isabel National Forest ranger at Salida, Colo., has been promoted to staff assistant for the Rio Grande National Forest. He will



be stationed at Monte Vista, Colo. *JACOB JAUNCH*, ranger for Wyoming's Medicine Bow Forest, will replace Mr. Van Buren. *CLIFFORD R. VAN DOREN* of the San Isabel has been shifted to the Gunnison National Forest.

Fuchs & Lang Mfg. Co., a division of Sun Chemical Corp., has announced the appointment of five sales and service representatives for the Middle Western area: *LES DRESCHER*, western Michigan; *FRED PROSCHEK*, Detroit and eastern Michigan; *HILLARD TOBEY*, Chicago and Indiana, and *TED WASILOWSKI* and *ART LARSON*, Chicago.

EDWARD J. REZABECK has been elected vice president in charge of production for Triangle Paper & Box Co., Chicago. He has been with the firm since March 1950 as superintendent of production.

J. H. BRINKER has been appointed assistant executive in charge of distribution at A. O. Smith Corp., Milwaukee, Wis. He formerly was general sales manager for the Southwest district, with headquarters at Houston, Tex.

Link-Belt Co., Chicago, Ill., has announced the appointment of *KENDRICK M. HICKMAN* as assistant sales manager of its Ewart plant at Indianapolis, Ind., for Ewart general products, and *CARL RUDMAN* as manager of agricultural sales at the Ewart plant to succeed Mr. Hickman. Mr. Hickman assumes the duties of *H. M. BOWMAN*, who is being transferred to Chicago, where he will handle sales promotional activities.

Michigan Alkali Division of Wyandotte Chemicals Corp., Wyandotte, Mich., has announced the following promotions, effective January 1: *M. J. CONWAY*, former manager of the Pittsburgh sales office, to manager of the newly created central district, with headquarters at Wyandotte, covering the state of Michigan, northern Ohio, northern Indiana, western Pennsylvania, western New York, and northern West Virginia; *H. C. BRUNNER*, former manager of the Detroit office, to manager of distributor sales; and *BERT McCORD*, formerly manager of the Detroit sales office of the general chemical division of Allied Chemical and Dye Corp., to sales representative in the central district, where he will assist Mr. Conway. Effective October 1, *R. C. LEONARD*, former sales representative in the Detroit office, became product manager of caustic soda and chlorine; *P. M. BIGLEY*, who has been with the company for over 35 years, was made product manager of soda ash, dry ice and bicarbonate of soda; *R. K. RIGGER*, former assistant manager of the organic chemical department, was named product manager of the newly created department of synthetic detergents; and *T. R. BOYLE*, former administrative assistant to the general sales manager, was appointed administrative assistant to the vice president of Michigan Alkali division. These men are located at Wyandotte. Other appointments, effective after the first of the year, are *P. G. FUGER*, former manager of the St. Louis territory, to manager of glass industry sales, and *L. C. REID*, former salesman and product manager, to manager of the Western district, extending from Canada to the Gulf and bounded by Indiana and Wyoming, with headquarters in Chicago.

Three new appointments have been made at Abitibi Service Inc. *P. S. CHURCH* has been promoted from manager to first vice president, and *R. W. ASHLEY* and *R. S. FOWLER* have been named vice presidents. Mr. Fowler, who has been associated with the firm's sales office in Toronto, Canada, for about five years, will take up his new duties in Dayton, Ohio about September 1. Before joining Abitibi, he was with Mead Corp. in Dayton as sales manager.

National Gypsum Co. has announced two promotions in its executive staff. *WILLIAM M. NORTH*, secretary, will become general manager at the government-owned National Gypsum-operated Kansas Ordnance Plant, Parsons, Kan., succeeding *COLON BROWN*, who will have general supervision of four of the company's subsidiaries, including two recently acquired Wesco Waterpaints Inc. concerns at Montreal and Berkeley, Calif. Mr. Brown will be located at the Buffalo executive offices.

ELMER F. MYERS, sales engineer of Farrel-Birmingham Co. Inc., Ansonia, Conn., has been transferred to Fayetteville, N.C., where he will cover the states of Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida and Alabama. He formerly covered the New England territory.

WALTER S. SCHAMEL has been appointed district manager of the Los Angeles office for American Wheelabrator & Equipment Corp.

Harris-Seybold Co. has announced the following personnel changes: *REN R. PERRY*, formerly general sales manager, has been named vice president in charge of sales, replacing *HARRY A. PORTER*, who becomes the company's senior vice president; *W. RAY SPILLER*, formerly chief engineer, has been elected vice president for engineering,

succeeding *CHARLES W. HARROLD*, who continues as a vice president in an advisory capacity; *GEORGE C. HOUCK*, formerly planning director and assistant to the president, will move into the newly created post of vice president for operations.

NORMAN B. SCOTT, of Orr Felt & Blanket Co., has been transferred to Jacksonville, Fla., where he will cover the paper and pulp mills located in the southeast.

THOMAS KARLEN, employment and personnel service manager at Marinette Paper Co., Marinette, Wis., has been promoted to assistant personnel manager. He was transferred to the plant from the Scott Paper Co. operations in Chester, Pa., in 1951.

LAMAR FLEMING JR., president of Fleming Pulp Mills, Houston, Texas, has been elected to the board of directors of the National Committee for Constitutional Government, New York, N.Y.

DR. OWEN A. MOE has been appointed manager of the Technical Sales Service Department at General Mills Research Laboratories. In his new position, Dr. Moe will be in charge of customer service requests for General Mills' experimental and semi-commercial chemical products.

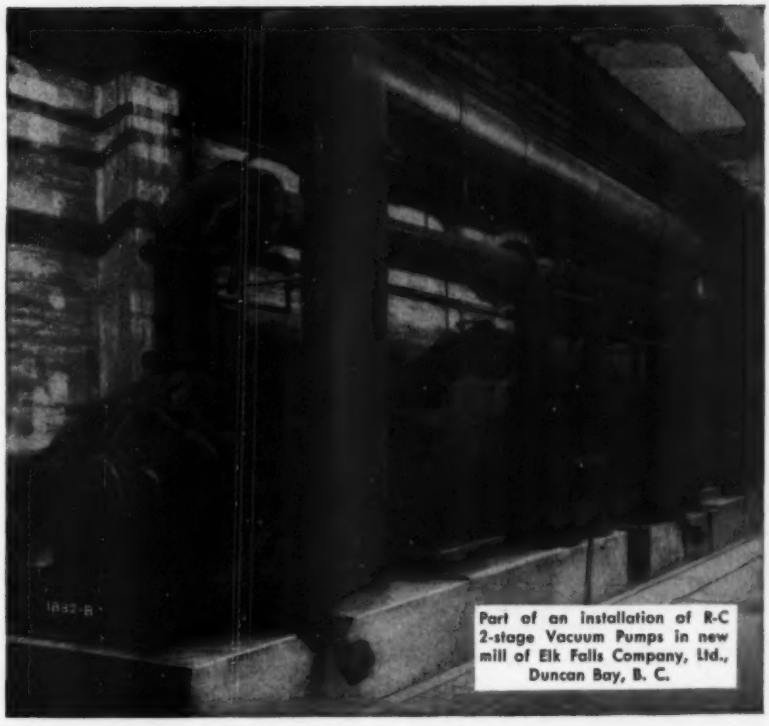
ANTONE HORSTMAN was recently appointed manager of laboratory operations at Bauer Bros. Co., Springfield, Ohio. He is in charge of both the pulp laboratory and the feed and milling laboratory. Mr. Horstman was formerly process engineer for Weston Paper Co. at St. Mary's, Ohio, and at Terre Haute, Ind.

Pagel, Horton & Co. Inc., New York City, has announced the appointment of *DONALD FRASER* as vice president. Mr. Fraser previously was connected with Soundview Pulp Co., and prior to that, with Fraser Companies Ltd. of Canada.

W. J. STEBLER has been elected executive vice president of General American Transportation Corp.

Recently elected to the board of directors of Canadian Chemical & Cellulose Co. Ltd., a subsidiary of Celanese Corp. of America, were: *A. E. GRAUER* of Vancouver, B.C.; *H. A. DYDE* of Edmonton; *M. W. MACKENZIE* of Ottawa and *R. L. WELDON* of Ontario.

DAVID MACK has been appointed director of employee relations of Lily Tulip Cup Corp.


Part of an installation of R-C 2-stage Vacuum Pumps in new mill of Elk Falls Company, Ltd., Duncan Bay, B. C.

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Add up the economies gained by selection of high-speed (600 rpm and above) R-C Vacuum Pumps, and you'll find handsome, long-time dividends, such as:

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But even more important than these operating savings are those that come from unquestioned, month-after-month reliability and performance of these simple, rotary positive units.

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ROOTS-CONNERSVILLE BLOWER
A DIVISION OF DRESSER INDUSTRIES, INC.

The Paper Industry Necrology

William J. Talbot, 51, yard superintendent for St. Regis Paper Co. in Deferiet, N. Y., died November 9.

Russell S. Roeller, general sales manager of Pennsylvania Salt Mfg. Co., died November 12 in Phoenixville, Pa. He was 60.

James E. Martin, 47, assistant chief engineer for Northern Paper Mills, Green Bay, Wis., died November 23. A graduate of the University of Wisconsin, he came to Northern as an engineer in 1929 and was made master mechanic in 1941. He was appointed assistant to the chief engineer in 1948.

Cornelius M. Major, 64, a superintendent of Chemical Paper Manufacturing Co., Holyoke, Mass., for 35 years, died at a Boston hospital August 15. He was a member of the Superintendents Association.

Hugh J. Fraser, vice president in general charge of all plant operations in the United States of International Nickel Co., died in Montreal August 22. He was 55.

Edwin S. Wilsey, 72, chairman of the board of Newton Falls Paper Mill Inc., Newton Falls, N.Y., died at Ligonier, Pa., September 19 while attending a reunion of the Princeton University class of 1904. He was a director of McGraw-Hill Publishing Co. and former president of the New York City Board of Education.

Lewis R. Stevens, 82, who was associated with Union Bag & Paper Co. in Hudson Falls, N.Y., New York City and Chicago, died August 9 at his home in Fort Edward, N.Y. At one time, Mr. Stevens had his own business, Niagara Bag & Paper Co., North Tonawanda, N.Y.

Dr. Gilbert Hudson Prince, 64, executive assistant to the minister of lands and mines in New Brunswick, died recently at his home in Fredericton. Dr. Prince was a pioneer in forest utilization, protection and maintenance in New Brunswick. He was known as the father of the New Brunswick Forest Service and drafted the province's first Forest Service Act and its Scalers' Act. He was N. B. deputy minister of lands and mines from 1924 until he was made executive assistant six months ago.

John K. Johnston, vice president of National Vulcanized Fibre Co. of Newark, Del., died August 25. He was a member of the Delaware State Republican Committee and chairman of the Delaware State Racing Association. Mr. Johnston was 60.

Thorwald A. Carlson, 59, nationally known packaging expert, died October 24 at Madison, Wis. Mr. Carlson directed the far-flung packaging operations of the military forces during World War II as chief of packaging research at the U. S. Forest Products Laboratory.

Robert J. Mees, who had been a stationery engineer for Hinde & Dauch Paper Co. for 30 years prior to his retirement recently, died last month in Sandusky, Ohio. He was 65.

James B. Ramage, 62, Midwest representative for H. Waterbury & Sons Co., Oriskany, N. Y., died November 8 at Beverly, Mass.

J. Pierre Rolland, president of Rolland Paper Co. Ltd., Montreal, died in October at the age of 66. He was a director of the Canadian Pulp and Paper Association.

George M. Diebold, 78, retired superintendent and plant engineer of F. N. Burt Co. Inc., Buffalo, died October 30 at his home.

Hiram Lewis Van Arnam, retired treasurer of J. P. Lewis Co., Beaver Falls, N. Y., died October 27. He was 88.

George Isaac Walker, 82, retired superintendent at Erving Paper Mills in Erving, Mass., died November 2 at his home near Atlanta, Ga.

John J. McCloskey, 32, technical sales representative for Nopco Chemical Co. in the Virginia-Maryland area, died October 26.

Edward E. Ames, 71, retired chairman and a director of General Box Co., Des Plaines, Ill., died September 28 at Evanston, Ill.

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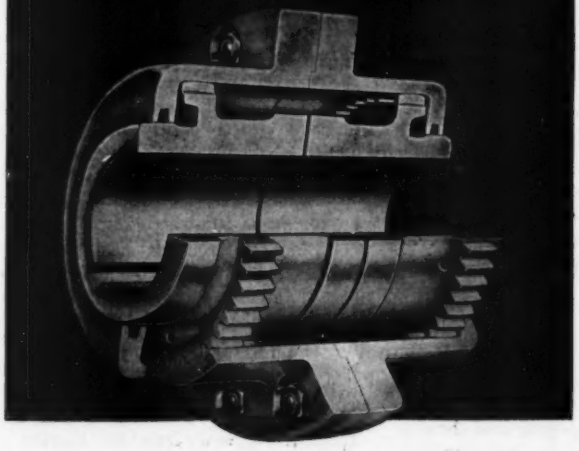

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The Paper Industry Safety News

Teamwork Called Key to Success of West Coast Safety Efforts

EFFECTIVE LABOR-MANAGEMENT teamwork stemming from a 1946 wage-hour agreement has been responsible for reducing the high frequency rates of industrial accidents in the West Coast pulp and paper industry by 80 per cent. This same teamwork has also been an important factor in the avoidance of at least 6,000 disabling injuries in 35 West Coast mills since 1945 and in lower industrial accident insurance rates. This dramatic success story of labor-management harmony was related recently by Robert N. Gilmore, general safety supervisor for Rayonier, Inc.

The International Brotherhood of Paper Makers and the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, together with the Pacific Coast Association of Pulp and Paper Manufacturers, have been staging safety conferences over a seven-year period in each of the three states—Washington, Oregon, and California—represented in the Association. During these conferences industrial safety education, accident prevention, and first-aid training are discussed for the over-all guidance of mill safety committees throughout the industry on the Pacific Coast.

Cooperative safety program

The cooperative safety program developed in the conferences has produced phenomenal results in accident reduction. According to Mr. Gilmore, frequency rates have been reduced from 39 in 1945 to under 8 at the end of September of this year.

During the safety conferences a delegate from each union local in each mill is present, the union paying his travel and personal expenses. Management, which is equally represented, reimburses the official union delegates for time actually spent at the conferences on the basis of eight hours per day up to two days. Attendance has grown from 60 to 200 since the plan was evolved.

The meetings are usually free of mention of codes, safety regulations or the use of federal or state legislation as a means to better safety performance, Mr. Gilmore reported. Instead, practical possibilities for accident reduction by more scientific approach through safety education, training, the development of safer work practices and studies in human relations and behavior as it affects safety performance are thoroughly discussed.

Mr. Gilmore quoted an official of a participating union as saying at an early labor-management safety rally that, "a new responsibility has been placed equally on employer and employee." And later a union field representative declared that the union had no desire "to use legislation as long as we can make progress through education."

Rates and costs down

That education and teamwork between labor and management has paid off is seen in a number of reports from mills showing that their annual accident frequency rates have dropped to 1.0 and under. At Rayonier, Mr. Gilmore explained, management "places safety on the same plane of importance that it places quantity and quality of production."

He said that the tremendous efforts of unions and managements have paid off with an enormous saving in lives and limbs and in money saved the employees who have been spared injury. In Oregon, for example, the manual rate of the State Industrial Accident Commission for the pulp and paper classification was $2.50 per $100 of payroll in the 1944-46 period. In 1951 this rate was established at the new low of $1.22 per $100 of payroll.

In the State of Washington the base rate for pulp and paper industrial accident insurance five years ago was 4 cents per workman hour. Today it has been reduced to 1½ cents, and there is every indication that the industry will receive a new and lower rate in 1953.

Banquet Held in Honor of Westvaco Tyrone Employees

The first of a series of four banquets and entertainments to honor the 800 employees of the Tyrone, Pa., mill of West Virginia Pulp & Paper Co. for their winning of the cash award of $100 presented by the National Safety Council was held recently at Altoona. The award was made in recognition of the mill's decrease in accident frequency rates for the six months ended October 31. Serving as master of ceremonies was Chalmers E. Barr, personnel director at Tyrone. James R. Shea, mill manager, was unable to attend because of illness.

New NSC Staff Rep. Appointed

Franklin G. Pater, a senior engineer in the industrial department of the National Safety Council, has been made staff representative for the Pulp and Paper Section. He succeeds Dan Adair, who continues in his post with the Wood Products Section.

Mr. Pater has had experience in industry and in the insurance, engineering, training and accident prevention fields. Prior to his affiliation with the Council he held the position of resident engineer with the Hartford Accident & Indemnity Co. While with Hartford, he was responsible for managing the engineering department in a branch office, formulating safety programs, foreman and employee training, and risk evaluation and improvement. He is a graduate of Iowa State College.

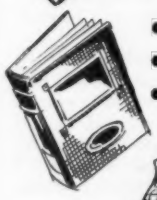
F. G. Pater

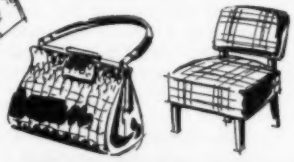
Mich.-Wis. Forest Industries Establish Safety Program

Recognizing the need for a sound program of accident prevention within the forest products industries, a number of firms have established the Michigan-Wisconsin Forest Products Safety Council. Headquarters for the newly formed group are at Ironwood, Mich.

Basing the need for such a council on the fact that the logging industry has an accident frequency rate higher than any other industry, members have pledged themselves to the promotion of safety within their own operations and the encouragement of all others in the industry to join in the program. The accident frequency rate for logging is over five times the national industrial average and has a severity rate second only to mining operations. The ultimate objective of the council is a substantial reduction of existing workmen's compensation rates through the elimination of the causes of accidents peculiar to the industry. Russell C. Hammond has been employed as safety engineer.

H-S Heavy Duty... EMBOSSERS





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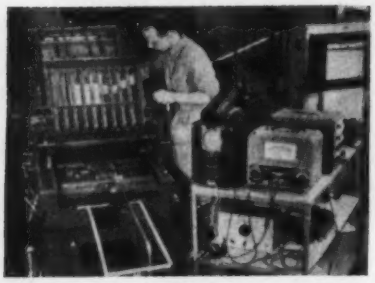


Fig. 1—The letterpress printing machine and the electronic instruments

Ink transfer to paper during printing

The present study involves general differences in ink transfer to various types of paper. An "ink distribution number" has been defined and used as a suitable indication of ink transfer to papers using different amounts of ink on the form under constant printing pressures. The ratio (*y*) between the ink on the *paper* and the ink remaining on the *form* is the "ink distribution number." This ink distribution and its full significance is adequately discussed and varies greatly with different papers or surfaces.

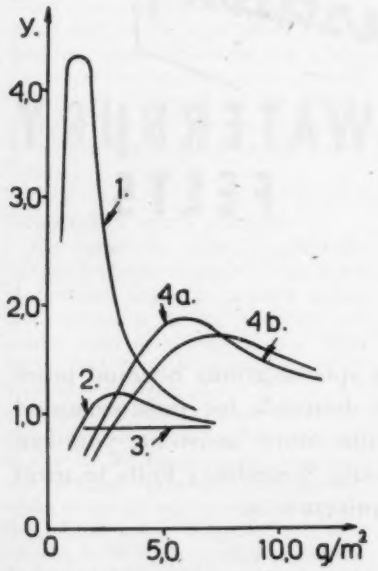


Fig. 2—Ink distribution curves for some different papers under comparable conditions

The equipment used was a Vandercook proof printing press (No. 41) with a GMA-frontex. The form was a copper plate (*1*), one square decimeter, detachable from a steel block, which could be inked and weighed on an analytical balance so that the ink distribution was determined precisely. The air in the press room was conditioned to 20 C. and 50 per cent relative humidity. In order to record printing pressures (which were carefully kept constant) and printing speeds, the press was supplied with proper instruments. The letter press and electronic equipment are shown in Fig. 1.

Interestingly enough, in the case of a glassine (with exceedingly low porosity), the distribution number (*y*) for a definite speed was practically constant, irrespective of the amount of ink on the form (indicated in grams per square meter). This is indicated by the horizontal line *3* on the graphs in Fig. 2 (which shows ink distribution for papers of different surfaces). In this same figure, curve 1 shows distribution for a coated paper (showing a high maximum for a low ink content on the form); 2 shows the distribution on a supercalendered paper, and 4a for the felt side and 4b for the wire side of a newsprint paper.

In the case of newsprint, the maximum occurs at points at which there are appreciable amounts of ink on the form (in contrast to curve 1, Fig. 2). The amount of ink left on the form after printing coated paper is less than that for other types of paper. The influence of different printing conditions on ink transfer will be reported in other papers. Lennart Pihl (Contribution from the Graphic Arts Research Lab., Sweden). *Svensk Papperstidn.*, **55**, 358-62 (1952). (In English.) (No references.)

Shrinkage and expansion of the paper web on the paper machine

An illustrated lecture (which apparently contains new experimental data) shows the relationship between shrinkage (I) of a web during manufacture and the dimensional changes of the finished sheet, especially the percentage of "wet expansion" (II) *(Nassausdehnung)*. II is determined by carefully measuring a finished air-dried conditioned paper strip, immersing it 2 hours in water at 20 deg., and then measuring dimensional change. Those factors which promote or inhibit the "dynamic quality" ("Lebendigkeit") of paper are stressed.

Data on I between wet presses and the dryers are obtained for 80 papers made from rags, groundwood and chemical pulps (or mixtures of these) on three different machines. The type of stock and the operations in the beater exert a far greater influence on shrinkage than does any variation in paper machine operation. A close relationship exists between cross machine web shrinkage (I) and II in this same direction; I is far greater than II in the machine direction. In either case, II is greater in sheets taken at the edges of the web than at the center.

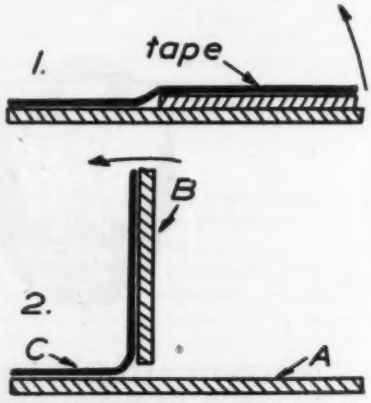
Rag and stock rich in mechanical pulp are less subject to I than are papers made exclusively from chemical pulps. With tight paper draws, II in the machine direction may give way to I in this direction. Slack paper draws, light felts, and wet presses and a relatively low water content of the web at entry into the dryer section lower both I and II in the cross machine direction. Tight paper draws decreases II in the machine direction and increase I and II in the cross machine direction. Carboxymethylcellulose used as a beater additive reduces I and II in the cross machine direction.

Within the range of 60-90 per cent dry weight occurs the greatest increase in I (in the cross machine direction) whereas up to 60 per cent dry weight II (in the machine direction) increases, but on further drying reverts into a slight I. The author's work confirms that of previous investigators [cf. for example, Arlov and Ivarsson, *Svensk Papperstidn.*, **54**, 729 (1951)]. Wilhelm Kilpper. *Das Papier*, **6**, 216-20; 290-93 (1952). (In German.)

Surface strength of paper

"Picking" of paper during the printing process is discussed at some length, and a method for testing the surface strength of paper by means of a Schopper tensile strength tester is fully described.

This new method was developed at the Graphic Arts Research Laboratory in Sweden and is carried out by fastening a tape on the surface of the paper and measuring the initial force required to pull



Figs. 1 and 2—Preparation of a test sample

apart the tape, as well as the surface layer of the paper, at a constant drawing speed. The adhesion of tape to paper must be so strong that surface fibers are actually pulled away from the sheet. The paper to be tested is placed on a flat surface and *half* of it is covered with another paper. The tape is attached to *both* papers and levelled out by rubbing with the finger from the upper to the lower strip. The strips (upper and lower) should then be so cut that one mm. of paper extends outside the tape on either side. The specimens are arranged and folded as shown in Fig. 1, 2, and 3. The specimens are then clamped in a Schopper tester, a fixed drawing speed is adjusted, and the force required to just loosen the paper

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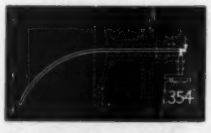
Reaction of ¾" Auto-Flex in 48" dia. dryer. Very low leverage.



Reaction of ¾" ordinary bent pipe. Syphon in 48" dia. dryer. High leverage.

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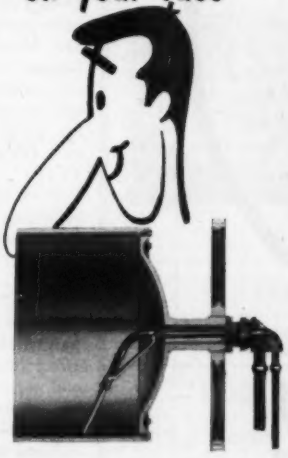

The above cuts and captions tell the Midwest Auto-flex Syphon story—and it's as plain as the nose on your face.

End of pipe takes correct position and cannot possibly change its position. That means proper water and air removal. Reduced leverage, compared to other syphon pipes, permits the "pipe" to clear and stay clear of the journal. And that means freedom from wear, hence far longer life.

Thousands of Midwest Auto-Flex Syphons in use and doing fine. A dozen orders from you would prove all claims and makes you an Auto-flex booster. Remember, they're fully guaranteed.

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surface is determined. The greatest difficulty in making the test is that the quality of commercial tape is such that the bonding strength between paper and tape is often inadequate.

A special instrument was built to study how the adhesive properties of the tape affected the results. This instrument measures the force necessary to pull away the surface of the paper. This is done by means of strain gages connected to a dynamic measuring bridge. In order to record the force, the bridge is connected to a cathode-ray oscillograph supplied with a camera, with which the screen can be photographed. In other respects, the testing procedure is similar to that used with the Schopper apparatus (i.e., the same mounting device and constant tension speed). On pulling the tape from the paper, the *adhesive* is split, or the tape loosens entirely from the paper surface, or (when the test is satisfactory) the adhesive layer is so strong that only the *paper surface* splits.

After testing a number of commercial tapes, the authors developed their own—a solution of polyvinylacetate adhesive with plasticizer is applied to a cellulose acetate film, and the tape dried. Such tapes (when dry) have satisfactory bonding strength.

Experiments carried out with letterpress printing paper and various offset printing papers show that the tension speed should be about 100 mm. per min. The width of the tape is important, but any width can be used, and the results recalculated to a standard width (because the force is a linear function of tape width). The storing time should be kept constant, the optimum time depending on the character of the adhesive. A strip of about 8 cm., of which 5 cm. is used for the flaps A and B, appears suitable (see Fig. 3). All papers must be examined both in the machine and transverse directions. In general, the surface strength is

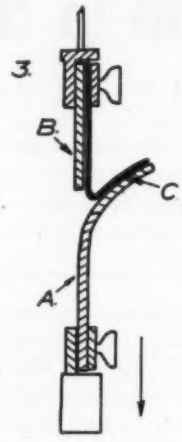

Fig. 3—Mounting of a test strip in the Schopper.

greater in the machine direction. In all instances, the appearance of the surface layer is carefully studied so as to be sure that "picking" has actually occured. A comparison of the above method with the standard Dennison wax test shows good agreement. A. Arnamo, I. Olsson, and L. Pihl. *Svensk Papperstidn.*, **55**, 709-714 (1952). (In English).

Comparison of the behavior on beating of a chemical wood pulp and groundwood

A contribution from the Technische Hochschule, Darmstadt. Although the behavior on beating of chemical pulps has been fully studied, that of groundwood has hitherto not been investigated. A steamed spruce groundwood (I), a standard newsprint spruce groundwood (II) and an unbleached medium hard spruce sulfite pulp (III) were beaten in a Jokro mill (IV), and also in a laboratory beater (V).

Prior to beating, the pulps showed the following properties for I, II and III respectively: degree Schopper-Riegler, 48, 62, and 15; per cent swelling, 157, 215, and 131; total per cent (long and short) fibers, 62.0, 63.5 and 90.5; per cent fine-stuff, 30.2, 35.8, and 9.4; of the three pulps, III showed the highest burst, Brecht-Imset tear, capillary rise, folding number, and air permeability, whereas II showed the highest breaking length and brightness, and the lowest air permeability.

I and II were given both mild and drastic hydrations, whereas III was beaten under medium conditions. In all cases, beating proceeded more slowly in IV than in V, but the trends were similar irrespective of the apparatus or the operating conditions used. I and II showed similarities, both before and after beating, and were always very different from unbeaten and beaten III. Beating curves (due to initial hydration of grinding) were always higher at the outset for I and II than for III. The latter, after beating 65 minutes, still retained ½ of its long fibers, whereas after 30-40 minutes

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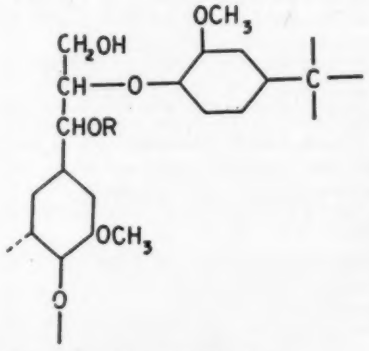
II and III had lost their long fibers completely and at the end of the beating operation consisted of about ⅔ finestuff and ⅓ short fibers.

The breaking length, burst, folding number, and folding endurance of III increased and developed in the usual manner as the beating proceeded (in IV); the maximum tear-through was reached within the first third of the beating period. Beating in IV of I and II caused only very slight increases in breaking length and burst, and sharp decreases in tear-through, folding number, and folding endurance (all of which are correlated with fiber length).

The initial wet strength (based on water content of 85 per cent prior to beating) was highest for III; this increased noticeably as the beating proceeded. On the other hand, the initial wet strengths of I and II decreased markedly on beating. In the case of density, absorptivity, and air permeability, beating had far less effect on I and II and on III, e.g., the initial high air permeability of III actually dropped sharply and after 40 minutes became less than that of I or II.

At the end of beating period the degree Schopper-Riegler was nearly the same for the three pulps, and the swelling values also showed only slight differences. It is evident that under the experimental conditions used beating offers no advantages for either I or II; in fact, it is frequently disadvantageous. Whether or not refiners which have less fiber cutting action would prove more satisfactory in the hydration of I or II is a subject requiring further study. Walter Brecht and Helmut Cornel. *Das Papier*, **6**, 200-205; 285-90 (1952). (In German.)



The structure of lignin

A comprehensive critical review by two of the outstanding investigators in Sweden's Forest Products Research Laboratory and Royal Institute of Technology. They take into consideration all reliable experimental data on lignin. As a result of this review, the authors conclude that lignin may include the grouping given in the accompanying Fgure, where R=an alkyl group. Such a structural unit should be sulfonated only by acidic sulfite solutions, and the sulfonation should not be accompanied by the formation of new phenolic groups. When lignin is dissolved out of wood that has been sulfonated previously with a *neutral* sulfite solution, then the R grouping should be hydrolyzed and hydrogen would replace the alkyl. Such a structure would permit relatively rapid sulfonation by acidic and rather slow sulfonation by neutral sulfite solutions. The structure given in the figure accounts also for the formation of formaldehyde when lignin is heated with acids. Presumably, lignin also contains monomers in which side chains are linked by carbon to carbon bonds to the benzene rings of *adjacent* monomers, and some of these monomers may be incorporated by virtue of chroman or coumaran rings. However, the presence of alpha-aryl ether systems must be quite low (because no very appreciable amounts of new free phenolic hydroxyls are formed on sulfonation). No present day structure accounts for *all* lignin reactions. Seventy-five references. Erich Adler and Bengt O. Lindgren. *Svensk Papperstidn.* (Kongress nummer), **55**, 563-575 (1952). (In English.)

West African woods

The possibility of utilizing African tropical woods in European pulp and paper manufacture is apparently unfavorable both from the technical and economic points of view. On the other hand, it is technically feasible to construct a pulp mill in West Africa for the production of marketable pulp. This would entail a large scale operation with modern equipment and a high capital investment, and it would appear best to integrate such a new mill with a preexisting (or new) sawmill or veneer plant. A map and five illustrations are given. Horst Niethammer. *Das Papier*, **6**, 225-60 (1952); *Allg. Papier Rundschau* 1952, 588-92 (1952). (In German).

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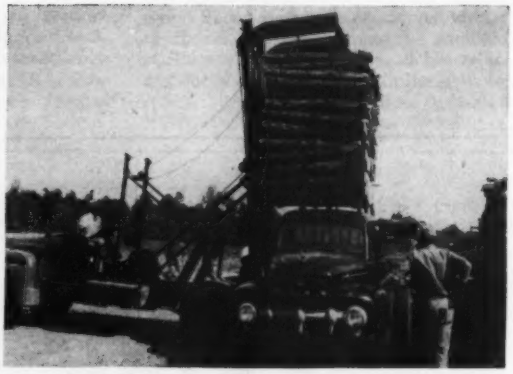
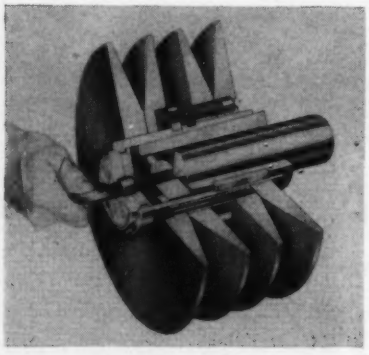
Pulpwood loading machine



Designed to fill a long-felt need in pulpwood operations, the new pulpwood Yardster is a compact and mobile tool for unloading pulpwood from trucks onto railroad cars. With this Yardster, a standard pulpwood truck can be unloaded and the wood loaded onto a railroad car in about six minutes.

This new machine comes equipped with a Mico brake-lock, which enables the operator, through a dashboard switch, to lock automatically the hydraulic system of truck brakes while loading or unloading. This lock can be released by simply depressing the brake pedal. Another outstanding feature is special cable hooks which can be released by the operator from his seat without use of rods or special connectors.

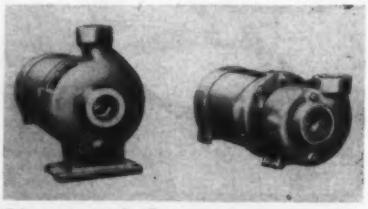
The Yardster is also equipped with a bumping plate which is easily controlled by the operator. The differential has been reversed so that all forward speeds are in reverse and the driver faces the load at all times. Standard automotive parts which can be serviced by any mechanic are used. *Taylor Machine Works, Louisville, Miss.*



Variable speed drive

A new variable speed drive incorporating the Taper-Lock principle has recently been introduced to the market. Engineering features in the four units which comprise the new drive cut down-time on speed changes and increase production, according to the manufacturer.

Components of this new Dodge variable speed drive are: a variable pitch motor sheave, a set of wide range belts, a companion sheave, and a slide motor base. The Dodge Taper-Lock principle is used in the bushings for both sheaves in the new drive. The drive is compact; the sheaves occupy a minimum space on the shaft. *Dodge Mfg. Corp., Mishawaka, Indiana.*



Close-coupled pumps

A package line of close-coupled pumps of types SAC and JMC, covering a capacity range from 5 to 150 gmp and heads from 0 to 110 ft. at speeds of 3,500 rpm, includes 29 combinations in ¾ in., 1¼ in. and 2 in. sizes, available with either three phase or single phase motors.

The casings are vertically split, pump and motor are supported on feet cast integral with pump, suction is located on the end, and discharge is vertical. Mechanical seal is standard on all sizes and easily replaced without disturbing suction or discharge connections. The impeller is balanced, of enclosed type, made of high grade bronze, and can be removed without disturbing suction or discharge connections. The motor is built to NEMA specifications and equipped with stainless steel shaft. These pumps are also packaged as pump, base and coupling units with which the customers' motors can be used. *Aurora Pump Co., 110 Loucks St., Aurora, Ill.*

Industrial stereomicroscope

A new industrial stereomicroscope for production, inspection and quality control uses embodies latest advances in optics for industry. It is available in a large range of wide field objectives and wide field eyepieces to provide the variety in size of field, working distance, and magnification needed for the newest specialized processing applications.

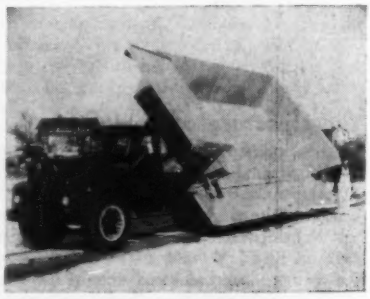
This stereomicroscope permits observation of an enlarged image with a wide field of view, long working distance, and three-dimensional, easily-interpreted qualities. When built into a processing or inspection set-up, it provides for continuing observation of the operation, so that quality control standards can be adhered to. It embodies vertical eyepiece tubes with adjustments for interpupillary distance and balancing acuity of the observer's eyes, binocular dustproof prism bodies, and illuminator socket.

In connection with the instrument, Bausch & Lomb offers a free consulting service whereby production and quality control supervision can explore new concepts of optics in industry. *Bausch & Lomb Optical Co., Rochester 2, N.Y.*

Acid pump

A new motor driven acid pump drains acids and other liquids safely and rapidly from carboys, drums and barrels. This pump has been designed for those requiring faster flow of acid and other liquids, and for those who, in some cases, must elevate the flow to a height of 12 ft.

The pump is self contained, portable, compressor and electric motor driven, and fully equipped with safety air valves which prevents the pressure from exceeding 15 lb. As regularly supplied, this pump will fit all standard carboys; however, special plugs and adapters are required to fit some stainless steel, aluminum, and plastic containers. *General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32, Pa.*



Side-dump truck body

Designed to handle pulpwood from the wood ranks to the hopper, the Easton Model BD-2112H hydraulic side-dump truck body may be mounted on any suitable truck chassis. Powered side-dumping eliminates the manual unloading method used at some mills, thus speeding the entire cycle of pulpwood handling.

The body is of all-welded steel construction and features a patented automatic down folding side door. This down folding door

Stickle Vacuum Pumps give Fitchburg more capacity . . . lower costs

This Stickle No. 40-20 Vacuum Pump services the No. 7 machine in the Fitchburg Paper Company. It is one of many installations in the Fitchburg district. Each pump is designed to handle a 25% capacity increase.

Easy inspection and maintenance—every vital part is easily accessible—mean lower costs. The built-in heat exchanger eliminates the need for costly cooling equipment.

The basic unit, employing standard horizontal motor and pump, is designed for vacuums up to 28". Duplex units are also available. Consider the advantages of installing Stickle Vacuum Pumps in your plant. Write for free bulletins 160 and 260.

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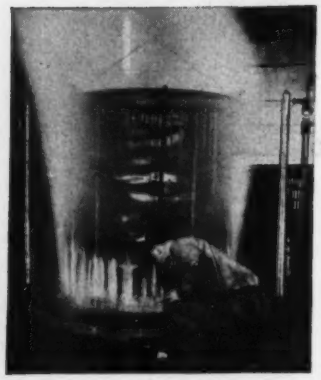

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MASTER OF THE "HOT RETORT"

Here Dwight Calaway is regulating the flow of water that cools one of our battery of annealing retorts. This type of furnace is used to anneal alloy plates and coils of wire.

Careful control of heat, varying according to material and requirements, is essential to assure retention of each alloy's special qualities.

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is lowered by the jacks that tilt the body sufficiently in advance to assure some of the load spilling before the body itself is tipped. This preserves stability of the unit whether loaded, partly loaded or empty. When the body is raised for dumping the door becomes flush with the floor, forming a chute which discharges the load into the hopper. Dumping is accomplished by means of hydraulic telescopic hoists located at each end of the body and controlled from the cab.

The body shape presents a wide loading area for the grab hook which is generally employed to load from the wood ranks. Capacity of the body is rated at 21 cu. yd., or 12 t. of pulpwood, *Easton Car & Construction Co., Easton, Pa.*

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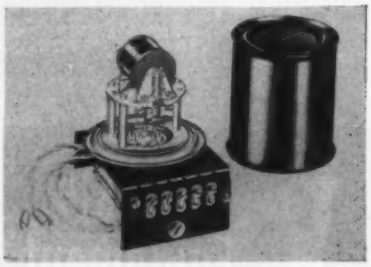
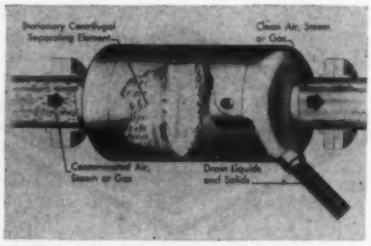


Synchronous inverter

The development of a synchronous inverter having a sensitivity of 0.05 microvolts and a dissymmetry of less than ½ of 1 per cent has recently been announced. Known as the Bristol Syncroverter Switch, this inverter is capable of converting low-power d. c. signals to alternating voltages that can be amplified and applied to electronic, electrical and servo systems.

This inverter will operate at any frequency from 0 to 3500 cycles. Instantaneous operation and length of life are not affected by vibration or shock. Errors due to thermal emf are eliminated by the use of two single-pole double-throw contacts. The contact-carrying armatures are of such low mass that their mechanical response is practically instantaneous. The inverter is free from resonance effects. It is hermetically sealed against dust and corrosion. The Syncroverter Switch is also available with two separate and independent single-pole double-throw contacts. *Bristol Co., Waterbury 20, Conn.*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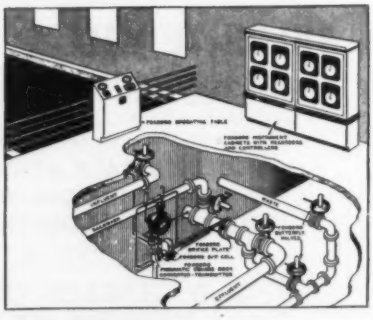
Clean Air, Steam or Gas
Contaminated Air, Steam or Gas
Drain Liquids and Solids

Line-type purifier

The improved line-type Hi-eF purifier combines increased separating efficiency with a more simplified design. It performs automatically and without any moving parts or baffle plates, removing virtually 100 per cent of all dirt, oil, moisture and "guck" from steam, gas, and vapor lines even at extreme velocities and pressures, according to the manufacturer.

The purifier removes the entrainment through a new stationary centrifugal separating element. The entrainment laden vapor entering the purifier is engaged by this element which imparts a carefully controlled but extremely rapid rotational motion to the vapor. This action throws all solids and water outward to the walls of the purifier. Here it is ejected out the drain. The entire action occurs without any appreciable drop in pressure, and the greater the velocity through the unit the better the separating efficiency. *V. D. Anderson Co., Purifier Div., 1935 West 96th St., Cleveland 2, Ohio.*



Control system

The new rapid sand filter control system uses completely integrated pneumatic transmission and control, thus eliminating service problems characteristic of mechanical control methods. Since no pulleys, cables, shafts or water pilots are necessary, one operator, working from a centrally located operating table, maintains filter control.

Pneumatic transmission makes possible the complete and compact instrumentation contained in the operating table. A four-position operation selector switch can be set for filtering, draining, backwashing or bypassing effluent to waste. Filtration rate is indicated by a rate of flow controller, with rate changes easily made by moving the controller setting index. Air switches, enclosed in the end of the operating table, permit manual operation of each valve in the system, independent of the automatic control instruments.

Other instruments in the system are factory-assembled in a dustproof cabinet, re-

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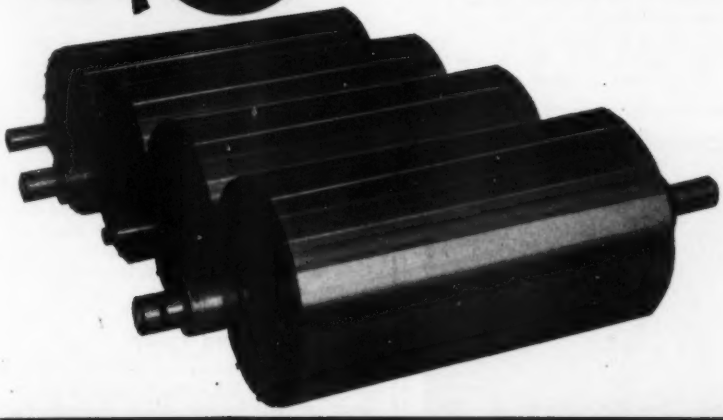

With new, corrosion-resistant Monel covers, the rolls are more efficient than before, for Monel guards against acid attack indefinitely . . . outlasts cast iron many times . . . saves the cost of new cores . . . eliminates frequent regrinding.

Both new and old rolls can be furnished with wear-resistant, corrosion-resistant Monel covers. Ask your paper machinery builder about them, or contact . . .

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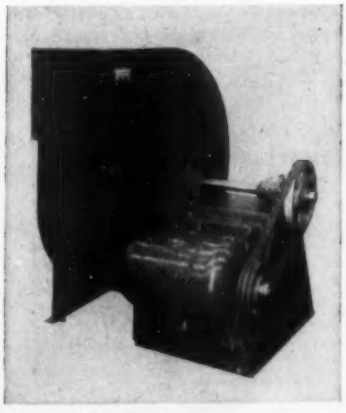
quiring only simple ¼ in. tubing connections for installation. Receiving instruments, which may be located in the superintendent's office or at other important points in the plant, may be connected to give identical, simultaneous readings. *Foxboro, Co., Foxboro, Mass.*



Industrial fan

A new, rugged industrial fan built with either an air handling, a materials handling, or a long shavings wheel is now available. The air handling fan is particularly suitable for exhausting smoke, fumes and light dusts. Conveying of sawdust, granular materials and chips are typical applications of the materials handling wheel. The long shavings wheel is designed for handling long stringy fibers.

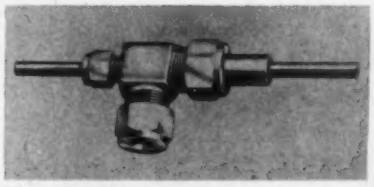
The fan is made in 11 sizes with capacities ranging from 670 to 44,000 cfm and pressures up to 16 in. water gauge. Standard accessories include both bolted and quick opening-type access doors, flanged outlets and inlets, and other outlet dampers. It is available with a variety of special coatings and can also be built of special metals to meet explosion-proof or anticorrosive specifications. For high temperture applications, special cooling accessories are available. *Westinghouse Electric Corp., Sturtevant Div., 200 Readville St., Hyde Park, Boston 36, Mass.*

Electric drive

A larger totally enclosed fan-cooled geared motor has been added to the Sterling line of Slo-Speed electric power drives.

These new units are double reduction and available with Class I, II and III gears in frame size 364/365, and AGMA speed 155 rpm and slower in ratings from 5 to 25 h.p. Bearings are mounted in the outer walls of the gear case and gears are mounted between these widely spaced bearings, permitting use of offset shafts and providing permanent bearing and gear alignment in uniform distribution of load.

Corrosion resistant grey iron housing, labyrinth seals, large safe terminal boxes and rugged helical gears make these geared motors well suited for low-speed drives where maximum protection is required against non-explosive liquids, dust or vapors. *Sterling Electric Motors, Inc., 5401 Anaheim-Telegraph Rd., Los Angeles 22, Calif.*



Heat exchanger tee

The new Swagelok heat exchanger tee, available in brass, aluminum, steel, stainless steel and monel, is precision-made for numerous uses throughout laboratories and process industries. It has been designed for steam jacketing or temperature control of process lines. It is useful in all cases where it is necessary to effect an exchange of heat between coolants and process fluids.

The small end of this fitting has been bored through the fitting to allow the tube to pass completely through the jacketed end. This tee is available in sizes up to 1 in. O.D. for the jacketing tube. *Crawford Fitting Co., 884 E. 140th St., Cleveland 19, Ohio.*

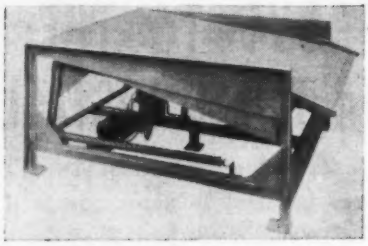
Humidifier

The new Type E unit humidifier is designed for use in all types of industrial and commercial spaces which require automatically controlled humidification. Units may be used for complete humidification systems, for spot humidification in large spaces, for boosting the capacity of existing systems, and for precise humidity control in laboratories.

The self-contained units are quickly and

simply installed by suspending from the ceiling, then connecting water supply and electricity. Water is atomized by centrifugal force and distributed horizontally through a 360-degree opening. Any portion of the discharge opening may be blocked off for directional distribution. Units evaporate up to three gallons per hour and may be installed singly or in groups with automatic control. Each unit will humidify several thousand cubic feet of room volume at normal conditions.

Construction, except for heavy-duty fractional-horsepower motors, is of non-corrosive metals with silver-grey hammerloid finish. Units measure 15½ in. high by 18¼ in. diameter and weigh 55 lb. *Babnson Co., 1001 S. Marshall St., Winston-Salem, N.C.*



Loading ramp unit

Portability and adjustability are the two outstanding features of this new loading ramp unit. It can be installed in five minutes at any loading dock and its hydraulically operated dock adjusted to any truck bed height in a few seconds, according to the manufacturer. The loading ramp's deck travel of 24 in. enables trucks of any bed height to be loaded or unloaded easily. Fork-lifts can be driven right onto trucks, the diamond floor plated deck providing maximum traction.

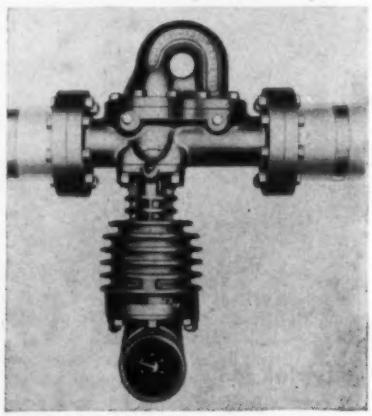
Another feature is an adjustable throw plate which can be easily raised or lowered for installation inside buildings without interfering with doors. The throw plate can be locked in horizontal position during loading, as can the deck, preventing accidental moving. Leg supports, which are not required for "recessed" installations, are furnished with "in-front-of-dock" ramps.

The portable loading ramp unit is available in two models, manual and electrically powered. The unitized power unit assembly consists of 110-v, single phase ½ h.p. ball-bearing drip-proof motor directly connected to a ⅜ in. standard Viking 350 lb. pressure hydraulic pump. The ramp is counterbalanced by heavy-duty tension-type coil springs to eliminate additional load on truck beds. It has a capacity of 20,000 lb. *John B. Illo Co., 2414 East 57 St., Los Angeles 58, Calif.*

Alarm-silencing relay

A new alarm-silencing relay that is automatically reset has been introduced to replace old-style manual alarm shut-offs for processing control systems.

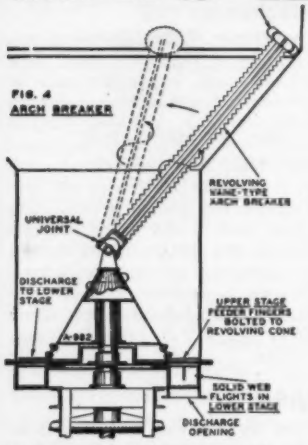
This relay provides a method for shutting down the alarm while insuring automatic reset when the alarm condition is corrected. A red pilot light on the relay warns until the alarm circuit has been cleared. In operation, when the controller switch makes contact, the alarm and pilot light are energized. When the operator pushes a button on the front of the relay, the alarm is stopped, but the pilot light remains energized. The light will go out when the improper condition is corrected, and the relay is then ready for the next cycle. *Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne and Windrim Ave., Philadelphia 44, Pa.*



Meter

The Model SMKS Shuntflo meter for measuring steam, air or gas has been redesigned and contains the following improvements: new, streamline damping chamber to facilitate a more uniform cooling system; all Meehanite body casting for greater strength and durability; a more

Get Free or MEASURED Flow of Wood Chips with an S-A circular bin discharger



S-A Circular Bin Discharger with Arch Breaker. Vane rotates on own axis as spider on end rolls around bin.

Insures uniform, positive discharge of raw or cooked wood chips, clay for paper coating and other bulk materials that otherwise tend to clog or arch over discharge openings. No handling or manual control is needed because discharge can be in measured volume as required; for example in combined discharge-feeder operations. Unit includes a revolving cone with projecting fingers that agitate the material and sweep it over a discharge outlet. All models may be had with revolving, vane-type Mechanical Arch Breaker that prevents bridging inside the bin and loosens packed material. Units are dust-tight, self contained and may be used with virtually any bin or silo. Capacities for all usual requirements. Write us for a copy of Bin Discharger bulletin 250.

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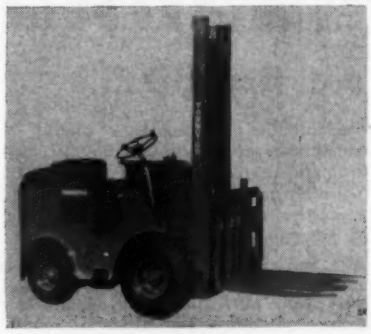
simplified rotor mechanism; and strengthened rotor shaft redesigned to withstand slugs of undue condensate in the line or sudden fluctuations in line pressure. *Builders-Providence, Inc., 345 Harris Ave., Providence 1, R.I.*



Lift truck side shifter

Extra agility for handling full capacity loads in tight spots is provided by the Side Shifter, a standard Towmotor accessory.

Especially useful in freight car loading, the Side Shifter has a smooth lateral travel of 3½ in. to either side of center. This simplifies placing loads tightly against walls and eliminates excessive maneuvering in areas where re-positioning the fork lift truck is difficult. Engineered to operate with standard Towmotor forks, Priester or Schmidgall forks, the Side Shifter does not affect normal operation of the fork truck, except for a slight variation in load center and capacity. *Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.*

New Products Briefs . . .

MICROSCOPE—A new 50 power pocket measuring microscope, known as the Optometer, is about the size of a fountain pen and has an engraved scale mounted in the body tube which reads directly to 0.002 in. It is useful for the examination and identification of fibre textures, distribution of coloring matter and sizing, and for inspection of fourdrinier wires for wear. *National Instrument Co., 5005 Queensbury Ave., Baltimore 15, Md.*

GRINDING WHEEL — Believed to be the world's smallest commercial mounted wheel, or abrasive point, this grinding wheel measures only 1/16 in. in diameter and is used extensively for grinding extremely small holes in miniature bearings, bushings, instruments, and for similar precision applications. *Chicago Wheel & Manufacturing Co., 1101 W. Monroe St., Chicago 7, Ill.*

SCALER-PRINTER—A new scaler-printer designed for radiation counting as applied in nuclear work, packaging, and other applications indicates in printed numerals up to 999 and provides for multiplying this figure by 2, 4, 8, 16, 32, and 64. It will resolve pulses separated by 5 microseconds and performs reliably for indefinite periods of time. *Research & Control Instruments Div., North American Philips Co., Inc., 750 South Fulton Ave., Mount Vernon, N.Y.*

FLUORESCENT INSPECTION — A new Blak-Ray ultra-violet source designed specifically for industrial fluorescent inspection, processing, and packing operations has recently been announced. The new industrial-type Blak-Ray Model XXX-40 covers an area of 20 to 40 square feet with intense (non-injurious) long wave ultra-violet radiation. *Ultra-Violet Products, Inc., 145 Pasadena Ave., South Pasadena, Calif.*

STRENGTH TESTING INSTRUMENT—A new D.C. high voltage dielectric strength testing instrument, Model 424 Hypot, has a continuously variable voltage output and a means to measure output current. Designed for electric insulation tests requiring various potential stresses, it permits calculation of D.C. resistance based on test voltage and output current flow. *Associated Research, Inc., 3758 W. Belmont Ave., Chicago 18, Ill.*

UNIVERSAL COUPLING—A new type of universal coupling, operating on the ball and socket principle, is available for all types of machinery requiring coupled shafts, either at an angle or straight line. The unit features simplified construction with a reduced number of working parts. A reservoir in the base of the socket retains lubricant for slow feeding to points of wear. *B. M. Root Co., York, Pa.*

SPRAYER—This sprayer will spray anything from a glass cleaner to a paint. It can be used for painting, disinfecting, cleaning, rustproofing, and for loosening frozen parts. It is easily charged in a minute with an inexpensive CO_2 cartridge. *Kano Laboratories, 1000 S. Thompson Lane, Nashville 11, Tenn.*

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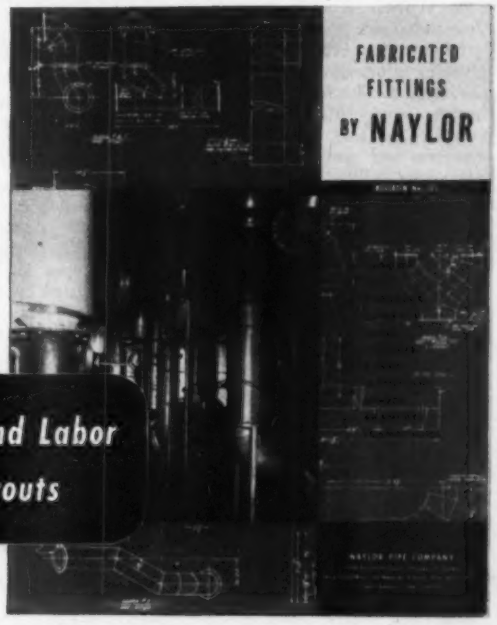
FABRICATED FITTINGS



Save Material and Labor in Piping Layouts

Write for this helpful bulletin on Naylor Fabrication Service. It presents data on standard and special fittings for lightweight pipe and offers practical ideas to simplify piping layouts. Included are special fabrications to save time, material and labor through eliminating numerous flanged joints and combining many fittings into one integral unit. Ask for Bulletin No. 525.

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The Paper Industry New Literature

Books

ENCYCLOPEDIA OF SURFACE-ACTIVE AGENTS. By J. P. Sisley and P. J. Wood. Published by Chemical Publishing Co., Inc., 212 Fifth Ave., New York 10, N. Y. 540 pages. $15.00.

Part I of this book deals with the general aspects of surface-active agents, their properties, applications and methods of manufacture. It also presents an efficient system of classification by which every variety of the modern surface-active agents can be identified by simple symbols.

Among the chemicals covered are wetting agents, detergents, penetrants, foaming compounds, emulsifiers, and dispersing agents. Their many applications in the paper, textile, rubber, and leather industry, in addition to many other industries, are described.

Part II is an alphabetical listing of brand name surface-active agents manufactured all over the world. For most of the items the following information is listed: brand name, manufacturer, identical or similar products, chemical composition, class, appearance, properties, reaction, references, patents, applications, and quantities used in different applications.

CHEMICAL ENGINEERING TECHNIQUES. By B. E. Lauer and R. F. Heckman. Published by Reinhold Publishing Corp., 330 West 42nd St., New York 36, N.Y. 450 pages. $6.00.

Emphasizing technique rather than specific equipment, this book presents industrially proven methods for conducting chemical manufacturing operations. Its primary purpose is to acquaint the reader with the many important considerations involved in the selection of the most suitable method for performing any of the several manufacturing tasks carried on in the chemical and process industries. Each technique is presented as a means to an end and all are classified according to function.

The material is grouped in six sections under the following topics: the assembly of materials; the preparation of materials for reaction; the production and distribution of energy; conditions affecting the chemical reaction; separation and purification of materials; and further treatment of products for sale, shipment, storage or other use.

FEDERAL AND STATE WEIGHTS AND MEASURES LAWS (Through 1949 Enactments). National Bureau of Standards Circular 501. Compiled by Kathryn M. Schwarz under direction of Ralph W. Smith. 1182 pages. $5.75. (Order from Government Printing Office, Washington 25, D.C.)

This compilation of weights and measures laws supersedes three earlier volumes on the subject published by the National Bureau of Standards in 1904, 1912, and 1926. The information presented comprises an up-to-date collection of federal laws and regulations and state laws dealing with the regulatory control of commercial weighing and measuring equipment and practices.

A comprehensive topical index of the entire volume and separate detailed tables of contents for the laws of each state and for federal laws are included. The introduction includes an account of Congressional action which has resulted in uniformity of standards throughout the United States.

TECHNIQUES OF PLANT MAINTENANCE—1952. Published by Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y. 182 pages. 8½ x 11. $6.00.

Containing the proceedings of the annual Plant Maintenance Conference and Show, this book presents the text of 717 questions asked by 2,100 engineers from every major industry in the country who attended the sessions, representing the best cross-section of current industrial engineering thought on maintenance problems.

Texts of all papers read at panels led by 36 outstanding leaders in the field are included, and the papers are illustrated by 49 charts, diagrams, graphs and tables. Also included is a manual for a lower repair and maintenance cost program, prepared by Westinghouse Electric Corp.

The papers are divided into groups of general and specific interests, and each group is followed with a question-and-answer section. General topics include costs, inspection methods and records, planning and scheduling maintenance work, and lubrication.

There are chapters on maintenance of electrical equipment; plant buildings; training maintenance workers and supervisors, and project preparation and cost control. Separate treatment of maintenance problems, according to the size of the plant, is given in five chapters, beginning with plants employing less than 50 maintenance workers and ending with plants having more than 800. Chemical, steel and automotive plants have separate chapters.

THE MEASUREMENT AND CONTROL OF TEMPERATURES IN INDUSTRY. By R. Royds. Published by Chemical Publishing Co., Inc., 212 Fifth Ave., New York 10, N. Y. $5.00.

This book covers the latest developments in temperature measurement and control to help many industries in maintaining the highest possible thermal efficiency.

The various methods and equipment which are available for the measurement of temperatures in each particular range are discussed. Ample space is devoted to the standardization and automatic control of temperatures in industry. Attention is given to improving the quality and reliability of industrial products, an increased rate of production, and the saving of fuel and labor by the application of automatic temperature controls.

Included are 116 illustrations—among them many interesting graphs—tables and numerous equations for calculating results.

A HALF CENTURY OF COLOR. By Louis Walton Sipley. Published by MacMillan Co., 60 Fifth Ave., New York 11, N. Y. $8.00.

This book is a clear guide to all the processes of color reproduction in photography, engraving, lithographing, and other graphic arts, with full color illustrations, many of them the only ones of their kind. A valuable reference on the different methods of reproducing color, this book also presents a complete history of color development.

Booklets and Pamphlets

THE CHARACTERISTICS OF PULP FIBERS FROM AGRICULTURAL RESIDUES (Bulletin AIC-323). By Elbert C. Lathrop. Published by Northern Regional Research Laboratory, U. S. Department of Agriculture, Agricultural Research Administration, Bureau of Agricultural and Industrial Chemistry, Peoria 5, Ill. 8 x 10½. 12 pages. Some of the topics covered in this booklet are: use of annual plants for papermaking; types of fibers available, including their chemical composition and properties, physical dimensions and properties, and their pulping characteristics; practical problems in pulping agricultural fibers; methods for practical utilization of agricultural fibers in papermaking; and methods for practical utilization of agricultural residues in making insulating, hard board, boxboard, and similar products.

FOREST PRODUCTS SURVEY. Prepared by U. S. Department of Agriculture, Forest Service, for Lumber and Wood Products Division of National Production Authority, Department of Commerce, Washington, D. C. 68 pages. This publication is a report on a nation-wide survey of the amounts of equipment, operating supplies and manpower used in 1950 by the primary forest products industries, sawmills and round wood concentration yards.

LIST OF PUBLICATIONS JANUARY 1 TO JUNE 30, 1952. Published by Forest Products Laboratory, Forest Service, U. S. Department of Agriculture, Madison 5, Wis. 5½ x 8. 14 pages. The name of the article, the author, the publication in which it appeared, and a short description of the

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ups production	simplifies grinding operation
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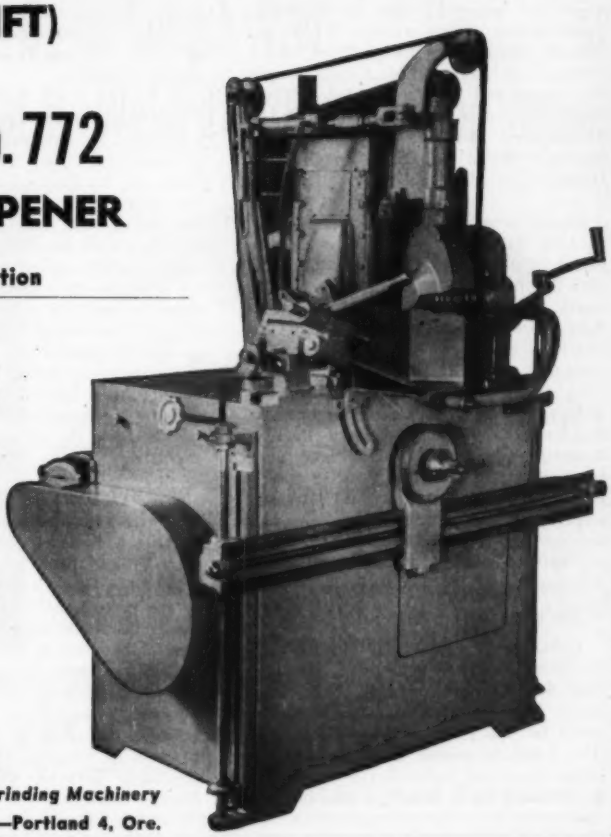

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article are grouped under the following classifications: Chemistry of Wood and Derived Products; Glues, Glued Stock, Plywood, and Veneer; Mechanical Properties; Paints and Finishes; Pathology; Pulp and Paper; Sandwich; Seasoning; Wood in Construction; Wood Preservation; Wood Structure; Wood Utilization, Logging, and Milling; and Miscellaneous.

PULPS FROM STRAW AND SUGARCANE BAGASSE FOR MANUFACTURE OF NEWSPRINT (Bulletin AIC-327). By E. C. Lathrop. Published by National Regional Research Laboratory, U. S. Department of Agriculture, Agricultural Research Administration, Bureau of Agricultural and Industrial Chemistry, Peoria 5, Ill. 8 x 10½. 4 pages. This paper which was written by the head of the Agricultural Residues Division of Northern Regional Research Laboratory explains how pulps from straw and sugarcane bagasse may be used in the manufacture of newsprint, including a description of experiments with industry and a cooperative project carried on by the Northern Regional Research Laboratory and the Forest Products Laboratory.

'MATERIAE VEGETABILES (Vol. 1, No. 1). Published quarterly by Dr. W. Junk, 13, Van Stolkweg, The Hague, Netherlands. 40.— Dutch guilders (about $10.50 U.S. coin) for year's subscription (4 numbers). This botanical review is dedicated to the whole domain of vegetable raw materials. It is a connecting link on the one hand between research, cultivation and extraction, amelioration, preparation and utilization on the other. The articles will be published in several languages.

MARKET GUIDE FOR THE PHILIPPINES. Published by American Foreign Credit Underwriters Corp., 170 Broadway, New York, N. Y. This second postwar edition lists more than 2,500 leading importing, distributing and manufacturing firms in the Philippine Republic, individually rated as to invested capital and credit status. In the new edition, a special section has been added listing U. S. merchant exporters with already established distributing facilities in the Philippines and showing the type of products in which each of these exporting firms specializes. The new Guide includes a detailed study of the Philippine market from the viewpoint of the U. S. exporter.

COMMERCIAL FAILURES IN AN ERA OF BUSINESS PROGRESS 1900-1952. Published by Dun & Bradstreet, Inc., 99 Church St., New York 8, N.Y. 32 pages. This booklet traces the growth of America from the turn of the century and analyzes the effects of the events of the day on the success or failures of business. A few of the 17 subjects covered are: why did 8,058 businesses fail in 1951?; trends in commercial failures and business population in nine geographical regions; the effect of three wars on the progress of American business, and the relationship between wholesale prices and business failures.

This announcement is neither an offer to sell nor a solicitation of an offer to buy any of these Shares. The offer is made only by the Prospectus.

253,008 Shares

Union Bag & Paper Corporation

Capital Stock

($20 Par Value)

Rights, evidenced by subscription warrants, to subscribe for these shares have been issued by the Company to the holders of its Capital Stock, which rights will expire at 3:30 P.M., Eastern Standard Time, on December 15, 1952, as more fully set forth in the Prospectus.

Subscription Price $42 a Share

The several Underwriters may offer shares of Capital Stock at prices not less than the Subscription Price set forth above (less, in the case of sales to dealers, the concession allowed to dealers) and not more than either the last sale or current offering price on the New York Stock Exchange, whichever is greater, plus an amount equal to the applicable New York Stock Exchange commission.

Copies of the Prospectus are obtainable from the undersigned only in States in which the undersigned is legally authorized to act as a dealer in securities and in which such Prospectus may be legally distributed.

MORGAN STANLEY & CO.

December 2, 1952.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.

Grapples. Blaw-Knox Co., Bucket Dept., Pittsburgh 30, Pa.—This 12-page illustrated bulletin, No. 2397, entitled "Grapples for Pulpwood and Logs" describes grapples designed for fast handling of uniformly stacked pulpwood and logs. The dimensions and capacities of seven standard size grapples are given.

Freight Rate Map. Union Pacific Railroad, Omaha, Neb.—A new issue of Union Pacific Railroad's "Freight Rate Territorial Map of the United States" shows in color the territory and jurisdiction of the various freight rate bureaus and also the transcontinental groupings published in accordance with "Articles of Organization and Procedure" filed with the ICC in compliance with Section 5A of the Interstate Commerce Act. It defines the new trans-continental groups as published in Trans-Continental Territorial Directory No. 5 and also includes a chart showing corresponding groups in Trans-Continental Directors Nos. 40 and 41.

Steam Traps. Armstrong Machine Works, Three Rivers, Mich.—This 12-page revised edition of Bulletin 213 is a condensed catalogue on Armstrong steam and air traps. Diagrams, prices, physical data and other details are given. A full-page capacity chart shows actual continuous discharge capacities for all sizes of traps at various pressures. Two pages are devoted to calculation of condensate loads for various classes of equipment. The back cover carries a steam trap repairs parts list.

Resins. Bakelite Co., Div. of Union Carbide & Carbon Corp., 300 Madison Ave., New York 17, N.Y.—"Vinylite Resins," 16-page Technical Release No. 6, presents data on the wide compatibilitiy of Vinylite resin VAGH with other film-forming material. Latest information on the basic properties of this resin and suggestions for its proper use are included in this revised pamphlet. A section on paper coatings is included.

Control Thermometers. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Station 40, Wayne & Windrim Ave., Philadelphia 44, Pa.—Specification sheet 609 describes the Electr-O-Vane control thermometer, having snap action electronic control. The sheet consists of four pages and gives a comprehensive resume of the models available.

Motors. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.—Over 100 case histories of outstanding applications of Life-Line motors are depicted in a new 35-page booklet, B-4769. Most of the histories are illustrated with photographs or sketches, and each gives the particular application problems involved, the motor choice for the job, and the results. In more than half the cases, the geographic location and the user's name are included.

Process Instruments. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne & Windrim Aves., Philadelphia 4, Pa.—This 20-page booklet entitled "Tomorrow Is Today" is a brief picturization of today's industrial instrument story. It is an outgrowth of a private showing for NPA and other government agencies at Washington of new and improved instruments.

Induction Motors. Allis-Chalmers Mfg. Co., 991 S. 70th St., Milwaukee, Wis.—Construction features of Allis-Chalmers drip-proof and splash-proof squirrel cage induction motors are described in a new 6-page bulletin, 51B7693.

Roof Protection. Hallemite Mfg. Co., 2446 West 25th St., Cleveland 13, Ohio—Two new folders, one containing 4 pages and the other 6 pages, are now available. One deals with Halcoloid, homogenized roof waterproofing,

Bark Hard or Soft Woods up to 8′ in Length Wet . . . Dry . . . or Combined Dry and Wet With F.M.P. Welded M-Bar Barking Drums

M-Bar—Hot Rolled

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and the other gives specifications of the Hallemite cold process built-up roofs, explaining and illustrating step by step exactly how a properly constructed one or two-ply built-up roof is installed.

Tachometers. Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.—This technical data sheet No. 42P describes tachometers for speed measuring applications where a wide range of speed measurement is desired in a continuously indicating switchboard instrument.

Fuel. Stilcok Co., 1260 N. Mar Vista Ave., Pasadena, Calif.—Designated as Bulletin II. this 16-page presentation, "Smokeless Fuel or Coke Made in Stils," describes apparatus, process and complete plants for distillation of carbonaceous materials, bituminous coals, lignites, peats, oil shales, oil sands, wood, wood wastes, rubbish, garbage and sewage for recovery of their oils and gases and production of smokeless fuel, coke, charcoal and char residues.

Die-formed Rings. Abbott & Biddle, 2413-27 Federal St., Philadelphia 46, Pa.—A new catalogue sheet is designed to present complete information on plastic semi-metallic die-formed rings.

Paper Clamp. Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, Ohio—A new bulletin covering the application and operation of a rotary roll paper clamp, fork truck attachment, is now available. It describes the operation of the roll clamp in detail and shows how it may be adapted to various phases of the paper and boxboard industry. Specific information on the design and safety features of the device are also included.

Heat Seal Coatings. American Resinous Chemicals Corp., Peabody, Mass.—Data sheet C-66 describes a number of formulas designed for use on paper, glassine, aluminum foil and cellulose acetate.

Electric Tractor. Yale & Towne Mfg. Co., Philadelphia Div., Philadelphia 15, Pa.—A new 4-page booklet, P-996, describes the features of the model MT Worksaver heavy-duty electric tractor for industrial towing applications and presents a complete set of specifications.

Synthetic Waxes. Glyco Products Co., Inc., 26 Court St., Brooklyn 2, N.Y.—Synthetic waxes of a wide range of physical properties are fully described in the new 16-page catalogue, "Synthetic Waxes by Glyco." Tables of specifications are given and use data are listed for such applications as coatings, lubricants, adhesives, etc.

Tachometer Heads. Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.— Technical Data Sheet No. 57M describes Series 57M heavy-duty tachometer heads for measuring low speeds, either rotational or linear. Included are purpose, typical applications, outstanding features, description, coupling methods and precautions, selection of proper head, installation and use, specifications, and ordering instructions.

Tramrail Equipment. Cleveland Crane & Engineering Co., Cleveland Tramrail Div., Wickliffe, Ohio—The 12-page revised edition of Booklet No. 2008-H titled "Cleveland Tramrail Engineering and Application Data" is designed to give anyone a conception of what tramrail overhead materials handling equipment consists of and how it can be applied to bring about one or more of 15 definite advantages. Of special interest is the new material on covering track design, track stresses and the solution to track peening. Many photographs and sketches are used. A number of varied applications are illustrated.

Furfuryl Alcohol Resin. Maurice A. Knight Co., Kelly Ave., Akron 9, Ohio—Four-page Bulletin No. 6 gives the properties, uses, and applications of Permanite, a furfuryl alcohol resin used in the fabrication of corrosion-proof chemical equipment. Permanite towers, sinks, trays, jars, tanks, cement, pipe and ductwork are described.

Paper Stock Pumps. Allis-Chalmers Mfg. Co., 991 S. 70th St., Milwaukee, Wis.—PW paper stock pumps, designed and built to handle high consistence pulp and heavy liquors encountered in the paper industry and corrosive liquids with suspended solids in the chemical and other industries, are described in this 8-page bulletin, 08B7112A. Design features of a special adapter and feeder vane assembly are given, in addition to a description of the "Hi-Density" feeder and the universal joint spacer coupling. A conversion and range chart from which it is possible to select the pump of correct capacity for handling known quantities of liquid per day is included.

Plasticizer. Monsanto Chemical Co., St. Louis 4, Mo.—A technical bulletin on Santicizer 3, a sulfonamide-type plasticizer particularly useful in formulating heat-sealing or heat-sensitive adhesives and lacquer coatings, is now available. In addition to chemical and physical properties, the bulletin includes typical formulations for nitro cellulose heat sealing coatings and paper coating lacquers, polyvinyl acetate adhesives; and zein metallic decorative paper coatings, back-coatings for pressure sensitive tapes and hot melts for paper adhesives.

pH Control. Foxboro Co., Foxboro, Mass.—A review of pH theory and its practical applications in industrial measurement and control are contained in 16-page Bulletin 430-1. Featuring a step-by-step explanation of the units employed in the pH control cycle, this bulletin has many illustrations to show instrument details, typical process applications and accessory equipment.

Savealls. Oliver United Filters Inc., 33 West 42nd St., New York 36, N.Y.—This 4-page bulletin (No. 701-R) describes Oliver's line of drum-type and American disc-type savealls.

Chemicals. Stauffer Chemical Co., 420 Lexington Ave., New York 17, N.Y.—A revised 112-page edition of Stauffer's general catalogue covers basic chemicals for industry and agriculture. Considerable data are given on all products, including numerous tables on specific gravity, viscosity, specific heat, solubility and other properties.

Water Filters. Graver Water Conditioning Co., Dept. 32-7, 216 West 14th St., New York 11, N.Y.—Information on pressure-type filters for the removal of visible suspended matter from water is contained in 10-page Bulletin WC-107. Details of design and construction of these units is described, together with accessory equipment. The various available arrangements of valves and piping and aids in their selection for individual requirements are also fully discussed. Many illustrations of installations are included, together with complete tables of capacities, dimensions and weights for both horizontal and vertical filters.

Carbon Steel Tubing. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.—Technical information of value to engineers and designers associated with the fabrication of equipment operating at elevated temperatures and pressures is presented in a new 4-page data card known as TDC 142. Condensed data are given on mechanical and physical properties, upsetting, swaging, flanging, expanding, bending, and welding of seamless and welded carbon steel tubing.

Glass Fibers. Glass Fibers Inc., 1810 Madison Ave., Toledo, Ohio—"Micro-Fibers" made for conversion into paper-thin sheets by standard processes used in making paper is the subject of this 4-page leaflet. Data from a typical paper run, with a table of the properties of glass fiber paper are presented. A description of this run and a photograph of the finished paper is shown on the last page.

Molded Cups. Garlock Packing Co., Palmyra, N.Y. — Complete information on molded cups for pump pistons, hydraulic service, and pneumatic equipment is found in this new 6-page bulletin. Illustrations of various types of molded cups, service data, a complete list of sizes and part numbers, and typical applications are contained in the folder.

Sulphonic Acid Condensate. American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N.Y.—"Accocel 741 Dispersant" is the title of this new technical bulletin. Designed to relieve papermaking problems, Accocel 741 is a complex sulphonic acid condensate with high dispersing power. The bulletin, which describes the use and properties of Accocel 741, contains diagrams showing the effect of the product in various types of dispersions.

Ball Bearing Lubrication. Fafnir Bearing Co., New Britain, Conn.—This folder entitled "The Lubrication of Fafnir Ball Bearings" discusses the everyday problems of ball bearing lubrication and maintenance. The basic reasons why lubrication is necessary and discussion of the advantages of oil or grease are included. In addition, specific illustrations of bearing and housing design are shown.

Carrier Amplifier. Consolidated Engineering Corp., 300 N. Sierra Madre Villa, Pasadena 8, Calif.—4-page Bulletin No. CEC 1522A describes the Type 1-118 carrier amplifier, which is designed primarily for the smaller engineering and development laboratory not having a full-time staff devoted exclusively to testing.

Boiler Tubes. Tubular Products Div., Babcock & Wilcox Co., Beaver Falls, Pa.—Data of interest to engineers associated with the production of steam for heating, power and processing are included in a new bulletin, No. TB-331A. In addition to general information, the bulletin contains tables of maximum allowable working pressures of electric-resistance-welded steel boiler tubes for fire-tube and water-tube boilers and weights per foot for various tubing sizes.

Switches. Micro Switch, Div. of Minneapolis-Honeywell Regulator Co., Freeport, Ill.—The 24-page Catalogue No. 82 of precision snap-action switches covers safety, limit, and interlock switches designed especially for switching a.c. circuits in industrial and commercial applications. Complete information is given on each switch, including description, dimensions, mechanical characteristics, electrical characteristics and electrical capacities. Also in this catalogue is technical data and application ideas.

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Mechanical and electrical engineers; plant engineers; master mechanics; power plant supervisors; coating supervisor board mill; paper technologist; chemical engr. for asst. supt.; chem. and laboratory men for mills, also for demonstrating and selling; finishing foremen coated and uncoated papers; pulp and paper sales trainees; beater engineers; mach. tenders and back tenders.

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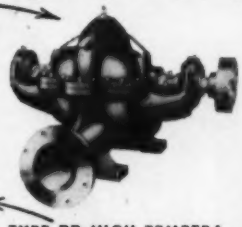

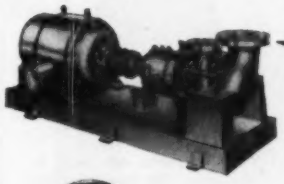

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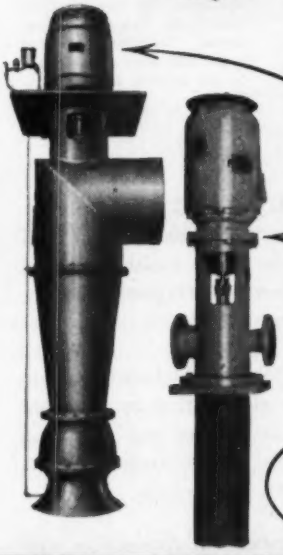

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A CYCLONIC JOB OF PULP CLEANING

Centri • Cleaners are made in two types. The Howard Smith type is No. 622 series (illustrated). The Hammermill type is No. 600. Both are described in our Bulletin No. P-4.

Until you see the debris removed from pulp by Centri • Cleaners, you can hardly believe that such an achievement is possible. The astonishing fact is that Centri • Cleaners reject bark fragments, shives, and pitch along with heavy dirt.

Because of the thorough job done by Centri • Cleaners, pulp stock comes out cleaner than by any other method. What's more, investment and operating costs are relatively low for the production of premium quality pulp, paper, and boards.

The only power requirement in connection with Centri • Cleaners is pump operation, which amounts to about 1 hp per day per ton of dry fiber.

In this space we cannot explain the system, but we have fully descriptive literature and exhibits which will be gladly sent to mill executives upon request. Write, wire, or phone us.

THE BAUER BROS. CO.

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MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are OPS ceiling prices, cents per pound, delivered mills:

	per cwt.
Blue Overalls	14.50
Corduroy	8.00
Washables, No. 1	6.50
Percales	12.50
Light Prints, No. 1	11.50
Khaki Cuttings—	
Sun Tan	11.50
Mixed	8.00
New White Canvas	19.00
Canton Flannels, bleached	21.00
Canton Flannels, unbleached	21.00
Shirt Cuttings—	
New White No. 1	21.00
Silesias No. 1	16.00
New Unbleached	21.00
Fancy	10.00
Linen Cuttings—	
American	14.50
White	21.00
Grey	21.00

Current quotations to mills, f.o.b. New York:

Blue Overalls	10.00 to 10.50
Washables, No. 1	4.50 to 5.00
Light prints, No. 1	8.00 to 8.50
Khaki Cuttings, Mixed	5.00 to 5.50
Canton Flannels, Bleached	14.50 to 15.00
Canton Flannels, Unbleached	14.50 to 15.00
White Shirt Cuttings, No. 1	14.50 to 15.00
Silesias, No. 1	11.50 to 12.00
New Unbleached Muslins	16.00 to 16.50
Fancy Shirt Cuttings	7.25 to 7.75
American Linen Cuttings	12.00 to 12.50

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing—	
No. 1	1.25 to 1.35
No. 2	.95 to 1.05
No. 3 and 4	.80 to .90
Twos and Blues—	
Repacked	2.50 to 2.75
Thirds and Blues—	
Repacked	2.25 to 2.50
Miscellaneous	1.75 to 2.00
Whites, No. 1—	
Repacked	5.75 to 6.25
Miscellaneous	5.00 to 5.25
White, No. 2—	
Repacked	4.75 to 5.00
Miscellaneous	4.00 to 4.25

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings New Mixed Cuttings New Light Silesias Light Flannelettes Unbleached Cuttings New White Cuttings New Light Oxfords New Light Prints	Nominal

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens No. 2 White Linens No. 3 White Linens No. 4 White Linens No. 1 White Cottons No. 2 White Cottons No. 3 White Cottons No. 4 White Cottons Extra Light Prints Ord. Light Prints Med. Light Prints Dutch Blue Cottons French Blue Cottons French Blue Linens Checks and Blues Linsey Garments Dark Cottons Old Shopperies	Nominal

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	5.50 to 5.75
Domestic	5.75 to 6.00
Wool Tares—	
Light	6.25 to 6.50
Heavy	6.50 to 6.75
No. 1 Scrap Bagging	4.75 to 5.00
Manila Rope—	
No. 1 large	6.75 to 7.00
No. 1 small	5.75 to 6.00
Sisal Rope—	
No. 1 large	6.00 to 6.25
No. 1 small	5.50 to 5.75
New Burlap Cuttings	6.50 to 7.00
Jute Threads—	
Foreign (Nom.)	6.75 to 7.25
Domestic	6.75 to 7.25
Strings—	
No. 1 sisal	5.75 to 6.00
No. 2 sisal	5.25 to 5.50
Soft jute	5.50 to 5.75
Mixed	3.25 to 3.50

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts	115.00 to 120.00
Hard White No. 1	80.00 to 85.00
Soft White, one-cut	75.00 to 80.00
Soft White, No. 1	65.00 to 70.00
Soft White, Misc.	40.00 to 45.00
Fly Leaf No. 1	25.00 to 30.00
Fly Leaf, Woody No. 1	25.00 to 30.00
No. 2 Mixed Col. Woody	20.00 to 25.00
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	20.00 to 22.00
Mixed Books	14.00 to 15.00
Ledger Stock—	
No. 1 White	55.00 to 60.00
No. 1 Mixed (Colored)	35.00 to 40.00
Manilas—	
New Env. Cuttings	55.00 to 60.00
New Env. Cuts, One-Cut	—
Extra Manilas	22.50 to 25.00
Manila Tab Cards, Free of Ground Wood	65.00 to 70.00
Colored Tab Cards	45.00 to 50.00
Kraft—	
New Envelope Cuttings	60.00 to 65.00
Tripled Sorted No. 1 100%	40.00 to 45.00
No. 1 Old Assorted	27.50 to 30.00
News—	
White Blank	65.00 to 70.00
Overissue	25.00—
No. 1 Folded	18.00—
Old Corrugated Containers	20.00—
New Jute Corrugated Cuts	26.00—
Mill Wrappers	13.00—
Box Board Chips	11.00—
No. 1 Mixed Paper	10.00—

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.55—
Ground, cwt.	4.30—
Powdered, cwt.	4.70—
Blanc Fixe—	
Pulp, bulk, ton	90.00—
Dry, barrels	95.00—
Bleaching Powder—	
Drums, cwt.	5.00 to 6.00
Casein (Domestic Standard)	
20-30 mesh (bags), lb. 80-100 mesh (bags), lb.	28.00—
Argentine, lb.	20.50—
China Clay—	
Domestic Filler Bulk (mine) ton	10.00 to 15.00
Domestic Coating Bulk (mine) ton	15.00 to 25.00
Imported (ship side) Bulk (lump) ton	22.00 to 30.00
Chlorine—	
Tanks cars (wks) cwt.	2.70—
Gelatine (silicin), lb.	1.25 to 1.35
Glyc. (C.P.) drums, lb.	34.00 to 34.50
Litharge, powd. bbl. lb.	.15¾ to .16¾

MARKET QUOTATIONS

Resin (Gum)—	New York, per 100 lbs.
E	8.35—
F	8.35—
G	8.35—
WW	8.80—
Rosin (Wood), carlots, F.O.B. South	4.35 to 4.50
Salt Cake—	
Dom. bulk (wks) ton	17.00 to 23.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	22.00—
Soda Ash—	
Bulk (works) cwt.	**1.20—**
Paper bags, cwt.	**1.50—**
Soda (Caustic)—	
Solid drums, cwt.	**3.25 to 3.40**
Ground and flaks, drums, cwt.	**3.75 to 3.85**
Sodium Silicate—	
60 deg. 55 gal. drums, (works) cwt.	1.60 to 1.70
40 deg. 35 gal. drums, (works), cwt.	1.30 to 1.40
Starch—	
Pearl, 140 lb. bags, cwt.	6.39—
Pearl, barrels, cwt.	6.39—
Paper (Sp.) bags, cwt.	6.39—
Powdered, barrels, cwt.	6.60—
Sulphur (Crude) (Mine) bulk, long ton	21.00 to 22.00
Talc—	
Dom. 100 lb. bags (mine) ton	**25.00 to 32.00**
Canadian	**35.00 to 45.00**
Titanium Dioxide—	
Barium Pig, bbls., lb.	**.21 to .21½**
Calcium Pig, bbls., lb.	**.21 to .21½**
Zinc Sulphide, bbls., lb.	**11.50 to 11.75**

WOOD PULP

The following are OPS ceiling prices on domestic wood pulp, dollars per short air dry ton delivered consuming mills including the basic maximum freight allowances as provided:

Bleached sulphite	140.00—
Unbleached sulphite	132.50—
Bleached sulphate	145.00—
Semi-bleached sulphate	140.00—
Unbleached sulphate	132.50—
Bleached soda	140.00—
Ground wood	92.50—
Sulphite screenings	72.50—
Sulphate screenings	67.50—
Ground wood screenings	60.00—
Unbleached sulphate siderums	132.50—
Standard news print siderum	92.50—

OPS ceiling prices on European wood pulp, dollars per short air dry ton, on dock at American Atlantic ports, follow:

Bleached sulphite	225.00—
Bleached sulphate	230.00—
Unbleached sulphite	200.00—
Unbleached sulphate	200.00—

Current quotations on imported wood pulp, dollars per short air dry ton, on dock American Atlantic ports with varying inland freight allowances follow:

Bleach. sulphite, Canadian	145.00—
Bleach. sulphite, Swedish	140.00—
Bleach. sulphite, Norwegian	140.00—
Bleach, sulphite, Finnish	140.00—
Unbl. sulphite, Canadian	135.00—
Unbl. sulphite, Swedish	115.00—
Unbl. sulphite, Finnish	120.00 to 125.00
Blch. kraft, Canadian	145.00 to 150.00
Blch. kraft, Swedish	142.50—
Unbl. kraft, Canadian	100.00 to 125.00
Unbl. kraft, Swedish	100.00—
Unbl. kraft, Finnish	105.00—

PAPER

Boards—

OPS ceiling prices (CPR 108) per ton, delivered consumer's mill, 10 tons or more:

Plain chip	90.00—
News vat lined chip	92.50—
Filled news	90.00—
Solid news	92.50—
White vat lined chip	132.50—
Chip tube and can stock	100.00—
Single manila lined chip	137.50—
Single jute lined chip	135.00—
White patent coated:	
.020	160.00—
.018	162.50—
.016	165.00—

Book Paper—

OPS ceiling prices (CPR 108) per cwt.:

Coated two sides

70 lb. No. 2 enamel, 25x38-500, trimmed 4 sides	4 cases $17.25 Carloads $16.30
45 lb. enamel, 25x38-500, trimmed 4 sides	4 cases $13.05 Carloads $12.10

Uncoated

55 lb. No. 2 offset, 25x38-500, trimmed 4 sides	4 cases $14.80 Carloads $13.85
50 lb. A Grade English Finish, 25x38-500, untrimmed	4 cases $14.05 Carloads $13.10
20 lb. envelope, 17x22-500, untrimmed	Carloads $12.40
16 lb. tablet, 17x32-500	Carloads $11.35

Rag Content Bond—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Extra 100% rag	57.50	58.50
100% rag	49.50	50.50
75% rag	38.00	39.00
50% rag	29.50	30.50
25% rag	24.00	25.00

Rag Content Ledger—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

Extra 100% rag	58.50
100% rag	50.50
85% rag	42.00
75% rag	39.50
50% rag	30.50
25% rag	25.00

Sulphite Bond—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Air dry bond (Watermarked)	20.00	21.00
No. 1 bond (M.F. watermarked)	15.50	16.20
No. 2 bond (M.F. watermarked)	14.90	15.60
Plain bond (M.F. unwatermarked)	14.00	14.60

Sulphite Ledger—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

No. 1, M.F. watermarked	16.50
No. 2, M.F. watermarked	15.90
Plain, M.F. unwatermarked	15.00

Glassine (f.o.b. mill)—

OPS base ceilings (CPR 76):	per cwt.
25 lb. base No. 1 bleached glassine	22.50—
25 lb. base No. 1 bleached greaseproof	20.00—

News—

	per ton
Rolls, Standard (Contract)	123.00 to 126.00
Rolls (Spot)	(Nominal)
Sheets	138.00—

Tissues (Carlots)—

	per ream
White No. 1	1.85—
White No. 2	1.35—
Bleached Anti-Tarnish	2.20—
Colored	2.00—
Anti-Tarnish Kraft	1.75—
Manila	2.00—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.90—
Napkins, full crepe and embossed (12½ lb. to M shts.) per cs.	.90—
Toilet, Bleached (M shts.) per cs.	10.00—
Toilet, Unbleached (M shts.) per cs.	8.00—

Towels

	per case
Bleached	6.80—
Unbleached	5.90—

Wrappings (Kraft)—

OPS ceilings, per cwt., 50 lb. base weight:	per cwt.
Standard wrapping	7.75—
Butchers, counter rolls	8.25—
Standard bag, mill rolls	7.50—
Shipping sack, mill rolls	7.75—
Gumming, mill rolls	8.00—
Asphalting, mill rolls	7.75—
Envelope, mill rolls	9.25—

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Atkins knives are extra sharp—and you'll find they stay that way through an entire scheduled run. They're extra tough, too—you'll see them slice through hardest wood with speed and ease. They're made of finest steel—carefully balanced in sets, heat-treated to exact specification, accurately ground to size. Most Atkins chipper knives are also ground with a *secondary bevel*, which adds to the strength of the cutting edge, helps clear the chips as they fall from the cut.

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PUT *ACTION* IN YOUR SAFETY PROGRAM

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Here are three film sets that will help you arouse and keep alive interest in your safety program. And there is no better way to teach foremen how to be better supervisors.

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A brand new set of films that will teach your foremen and supervisors the tips they should know about making safety talks, and how to transmit management's ideas and plans. Six 35mm sound slidefilms and leader's manual in an attractive leatherette case.

HUMAN FACTORS IN SAFETY

This is a series of six 35mm sound slidefilms with leader's manual that may be used for an advanced safety course. Each film deals with one aspect of the complex art of handling people. Collectively, the films show how to train workers, how to keep experienced people on their toes and how to win respect, cooperation and loyal support.

SAFETY MANAGEMENT FOR FOREMEN

A set of ten 35mm sound slidefilms—all that is needed for a course in safety fundamentals. The films explain how to organize a safety program, what part the foreman plays in the program and how safety increases production. They also discuss specific safety activities, such as machine guarding, safety inspections, the first aid program, etc. Complete with leader's manual in an attractive leatherette case.

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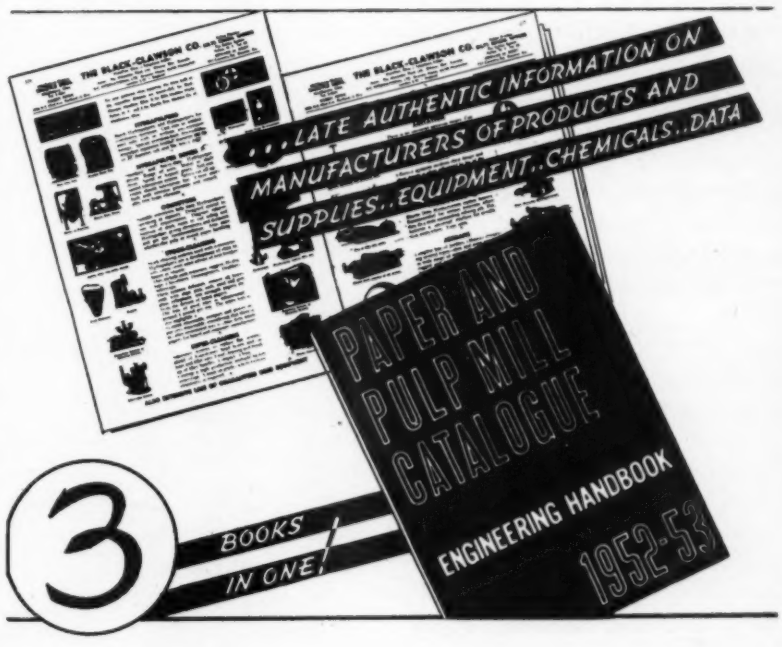

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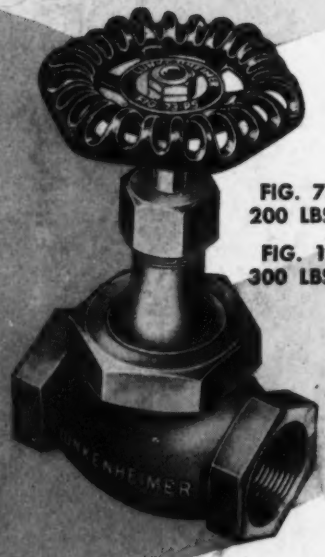

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